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The Impact of Downsizing on the Munitions Carrier Industry

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Abstract

This paper analyzes the impact of military downsizing on motor carriers specializing in the transportation of DOD ammunition and explosives. Historically, DOD has relied heavily on the motor carrier industry to transport its munitions. However, the number of munition carriers has declined in recent years and may decline further as a result of downsizing within the military. Presented are a profile of munition carriers, impacts of military downsizing on munition carriers, and implications of carrier impacts for DOD. Recommendations for DOD include: maintenance of DOD organic transport capability, continued emphasis on containerization of munitions, negotiation of multicarrier awards, negotiations based on best value, development of alternatives to carrier disqualification, and restriction of Class C ammunition to munition carriers.

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Introduction

Throughout modern warfare, the ability to maintain substantial firepower has often made the difference between military success and failure. This is particularly true of the United States (U.S.), which has pursued a strategy of applying decisive force in military operations to defeat enemy forces quickly, with minimum loss of American life.[1]

The most recent example of the U.S. applying this strategy of decisive force is the 1990-91 war with Iraq (Operation Desert Shield/Desert Storm). Critical to the success of this strategy in Desert Shield/Desert Storm was the deployment of large numbers of troops, equipment, and supplies from the U.S. to Southwest Asia.

While pictures of planes and ships arriving in Saudi Arabia may be the most remembered aspect of the Desert Shield/Desert Storm deployment, these images would not have been possible without prior movement within the Continental U.S. (CONUS). In terms of CONUS movements, thousands of rail carloads and truckloads moved as part of the Gulf War deployment. Participating in these movements were every major railroad and nearly every segment of the motor carrier industry.

Consistent with U.S. strategy of applying decisive force, munitions were one of the major commodities shipped during the Gulf War. From August 1990 through February 1991, commercial motor

carriers moved within CONUS nearly 24,000 shipments, totaling over 300,000 tons of ammunition and explosives. During the same period, rail carriers moved over 1,300 shipments, totaling over 230,000 tons.[2]

The Department of Defense's (DOD) reliance on commercial transportation to haul munitions during Desert Shield/Desert Storm is indicative of its dependence on available and responsive munition carriers. While the number of major rail carriers has remained steady during the past decade, the number of motor carriers hauling munitions has declined during the past few years and could decline further as a result of downsizing within the U.S. military.

In light of DOD's dependence on commercial motor carriers to haul munitions and the importance of knowing the capabilities of these carriers for future deployment planning, this paper analyzes the impacts of military downsizing on motor carriers hauling DOD munitions (hereafter called the munitions carrier industry). Presented are:

1. A profile of the munitions carrier industry.
2. Downsizing actions affecting DOD munition traffic volumes and operations.
3. Downsizing impacts on the munitions carrier industry.
4. Implications and recommendations for DOD.

Profile Of The Munitions Carrier Industry

Structure and Size

Currently, there are 30 motor carriers authorized by DOD to transport its munitions (see Appendix A).[3] These carriers form a small, highly specialized segment of the motor carrier industry. When compared to the entire motor carrier industry, munition carriers comprise less than 0.05 percent of motor carrier companies, revenue, and employment.[4]

The number of munition carriers is following a downward trend. This trend has resulted primarily from carriers leaving the munitions market and consolidations. In terms of new entrants, only a few carriers have entered the munitions market during the past few years. This is in sharp contrast to the general freight segment of the motor carrier industry which has experienced thousands of new entrants since deregulation of the early 1980s. Factors steering carriers away from the munitions segment include low profitability, lack of market growth, the hazardous nature of the commodities hauled, and significant Government regulation of munition carriers.[5]

Concentration

Traffic and revenue are highly concentrated among a few munition carriers. As shown in Table 1, ten carriers handle virtually all munition shipments moved over the highway and receive virtually all revenue paid to the industry by DOD.

Table 1
Concentration Levels
Munition Shipments and Revenue (FY 1992)

Carriers	Percent Shipments	Revenue
Top 4	63	65
Top 8	85	87
Top 10	92	93

Source: Military Traffic Management Command

Tri-State Motor Transit and McGil Specialized Carriers, both members of the same corporate family, form the largest of the munition carriers, handling a combined 33 percent of all shipments and receiving 34 percent of all revenue. Other major carriers include Baggett Transportation; C. I. Whitten Transfer; Ranger Transportation; T. F. Boyle Transportation; Diablo Transportation; Knox Truck Lines; and Prestera Trucking Company.[6]

Customers

DOD is the munitions carrier industry's principal customer. Among ammunition buyers, DOD accounts for nearly 85 percent of ammunition sales (excluding small arms ammunition), 40 percent of small arms ammunition sales, and 40 percent of explosive sales.[7]

With few exceptions, munition carriers have diversified into munitions and non-munitions markets. Despite diversification, half of the industry's top ten carriers are dependent on DOD munitions traffic for a third or more of their operating revenue.

DOD transportation requirements are grouped into truckload,

less-than-truckload, and dromedary categories. Truckload shipments consist of those weighing 10,000 pounds or more. Less-than-truckload shipments weigh under 10,000 pounds. Dromedary shipments consist of munition movements made in a container mounted behind the power unit of a truck or carried on a flatbed trailer.

As shown in Table 2, the U.S. Army is by far the largest shipper of munitions within DOD, generating up to two-thirds of all munition traffic. This large share stems principally from its role as single manager for conventional ammunition.

Table 2
DOD Ammunition and Explosives Tonnage - All Modes
Percent by Service

	Fiscal Year		
Service	1988	1990	1992
Army	68.0	64.2	56.4
Air Force	11.6	12.2	15.4
Navy/Marine Corps	18.3	14.4	18.5
DLA	2.1	2.6	9.7
Total	100.0	100.0	100.0

Source: Military Traffic Management Command.

Commodities

DOD ships hundreds of munition items. For transportation purposes, the American Trucking Associations classifies these items into two broad groups: (1) nonexplosive ammunition (National Motor Freight Classification items 14000 to 14280) and (2) explosives (National Motor Freight Classification items 64300 to 64303).[8] Examples of the former include practice bombs, dummy bombs, bomb bodies, empty cartridge shells, and inert fuses. Examples of the

latter include: explosive or incendiary ammunition; gas, smoke or tear producing ammunition, small arms ammunition, blasting agents, flares, fusees, and propellants. The Military Traffic Management Command (MTMC), DOD's traffic manager, uses DOD unique commodity codes for ammunition and explosive shipments (064300 Sub 01 - 04).[9] To reduce carrier financial liability, these DOD codes contain released values of $2.50 and $5.00 per pound. By shipping under released values, carriers are able to limit their financial liability to dollar amounts equal to the weight of the shipment multiplied by the appropriate released value.

Over 90 percent of the ammunition and explosives shipped by DOD is categorized as hazardous by the U.S. Department of Transportation (DOT).[10] DOT prescribes a hazard class to these items which is used by shippers and carriers to determine proper shipment preparation and transportation requirements. DOT has recently revised its classes to conform with international standards. New classes and divisions for explosives are shown in Table 3.

In addition to DOT hazard classifications, DOD classifies ammunition and explosives that are a definite threat to public safety and that can be used for civil disturbances, domestic unrest or criminal actions as sensitive material.[11] Based on their utility, casualty/damage effect, adaptability, and portability, DOD assigns these sensitive items a security risk category from I to IV. The assigned risk category determines the type of security protection required during transportation.

Table 3
USDOT Hazard Class 1 - Explosives

Class	Division	Name	Previous Class
1	1.1	Explosives with a mass explosion hazard	Class A
1	1.2	Explosives with a projection hazard	Class A or B
1	1.3	Explosives with predominately a fire hazard	Class B
1	1.4	Explosives with no significant blast hazard	Class C
1	1.5	Very insensitive explosives; blasting agents	Blasting Agents
1	1.6	Extremely insensitive detonating substances	None

Source: American Trucking Associations, ATA Hazardous Materials Tariff, ATA 111-L. Effective: January 30, 1993.

Government Regulation

The Federal Government is heavily involved in munition carrier operations. Major areas of involvement are operating authority, carrier qualification, safety, security, and quality assurance.

Operating Authority/Carrier Qualification. All carriers interested in transporting DOD munitions in interstate service must possess certificates issued by the Interstate Commerce Commission authorizing them to transport ammunition and explosives (operating authority).[12] As a result of motor carrier deregulation in 1980, obtaining these certificates is far less difficult than what it was

prior to 1980. Nevertheless, requirements for authority to haul Class A and B ammunition are more stringent than those for general commodity authority. Most notable are insurance requirements which require munition carriers to possess $5 million in public liability insurance as opposed to $750,000 for general commodity carriers.[13]

After receiving Interstate Commerce Commission operating authority, carriers must be qualified by MTMC before they are authorized to transport DOD munitions. The qualification process entails a thorough safety and security evaluation of the carrier, proof of insurance, and signing MTMC's Agreement Governing the Transportation of Ammunition and Explosives, Classes A and B, for the Department of Defense (see Appendix B). This agreement sets forth all requirements and conditions governing the transportation of DOD ammunition and explosives. A new item in the qualification process that has caused concern among munition carriers is the requirement to purchase a performance bond.

Safety. DOT has issued extensive safety regulations governing the shipment of hazardous materials.[14] Among these are requirements that shippers and carriers train their employees in recognizing and identifying hazardous materials, in emergency response information, in self protection measures, and in methods and procedures for avoiding accidents (see Appendix C for selected pages from Baggett Transportation Company's training materials).

In addition to these general requirements, DOT has established specific requirements for transporting hazardous materials over the highways. Among these are regulations governing placarding,

restrictions on transporting different hazardous materials in the same vehicle, and requirements for driver training. The industry expects DOT to issue additional regulations specifying which routes and roads can be used for munition shipments.[15]

Security. Due to the potential harm from loss or theft of ammunition and explosives, DOD requires that carriers provide transportation protective services for movement of sensitive items (see Appendix D). In general, these protective services require (1) the use of two-person driver teams when transporting sensitive items, (2) continuous attendance of the vehicle by at least one driver, and (3) use of satellite surveillance when transporting security risk category I - IV items. DOD's goal is to expand its satellite surveillance requirement to uncategorized items in the near future (see Appendix E). As a result of DOD's satellite surveillance requirement, munition carriers have been forced to obtain satellite communication service, maintenance, and equipment. Of concern to the industry is the low ceiling price DOD permits carriers to charge for this service (currently $.22 per mile with a planned reduction to $.13 per mile).

Quality Assurance. DOD holds munition carriers to a high standard of service quality. Virtually all service-related failures are subject to MTMC freight board actions.

Historically, the industry has shown itself very capable of meeting DOD transportation requirements. During Desert Shield/ Desert Storm, the industry received high marks for its service from

MTMC and the U.S. Army Armament, Munitions and Chemical Command (AMCCOM). Despite these marks, certain service-related problems did exist. Specifically, during the early days of Desert Shield, requirements exceeded locally available equipment, resulting in spot shortages of equipment at key plants and depots. Later, carriers ran short of empty equipment, necessitating leasing additional equipment. Finally, carriers ran short of qualified drivers to make shipments under DOD's dual driver security requirement.

Service-related problems, albeit different ones, have continued post-Desert Storm. Principal among these are incidents in which carriers fail to perform DOD safety and security requirements. To ensure safety and security requirements are performed and to identify instances in which they are not, MTMC has contracted with Stanley Associates to conduct random, covert surveillance on munition shipments (the TRANS Team). As a result of service failures identified, Headquarters, MTMC held 19 freight boards during FY 1992, most of which involved a munition carrier. Depending on the severity of and circumstances surrounding the service failure, MTMC actions ranged from minor administrative action to disqualifying the carrier from specific traffic lanes to disqualifying the carrier nationwide.

Competitors

The industry's principal competitor is the rail industry. Due to rail's cost advantage in high volume traffic markets, rail

competition is greatest on movements involving large traffic volumes. Of the 37 traffic lanes (origin/destinations) in which over 5 million pounds of ammunition and explosives moved during FY 1992, rail carriers were dominate (moved over 50 percent of the traffic) in 21 of them (57 percent). Rail dominance in the 142 traffic lanes having 1 to 5 million pounds was much lower, totaling 29 percent.[16]

While the Army possesses truck companies capable of transporting ammunition and explosives, DOD policy calls for maximum use of commercial transportation service.[17] Use of organic assets is reserved for essential training and for shipments not conducive to commercial transportation movement. Organic assets were exercised during FY 1992 in Operation Golden Cargo 92. Among the major movements in Golden Cargo was the shipment of over 14 million pounds of ammunition from Pueblo Army Depot Activity to McAlester Army Ammunition Plant.[18] While understanding the need for training, the movement of munitions via organic assets has caused considerable consternation among munition carriers.

Procurement and Pricing

MTMC routes all Class A and B ammunition and explosive shipments.[19] In routing these shipments, MTMC gives equal consideration to all modes of transportation and selects the carrier that will meet DOD requirements satisfactory at the lowest cost.[20]

To be considered for routings, munition carriers must have rates on file with MTMC. Rates are filed on either a voluntary

basis or in response to MTMC negotiations. Rates filed in response to MTMC negotiations are used in routing repetitive shipments over normally a 6-month period. Due to past reluctance of carriers and AMCCOM for routings covering periods of one year or longer, very few munition shipments are negotiated under MTMC's Guaranteed Traffic Program.[21]

Historically, carriers have responded quickly to reductions in rates by other carriers. During the late 1980's, this situation resulted in a multitude of rate reductions. Due to the number of rate reductions filed, MTMC had difficulties processing the rate changes, thus inhibiting their timely application.[22] As shown in Table 4, the effect of these reductions has continued into the 1990's except for FY 1991, the Gulf War period.

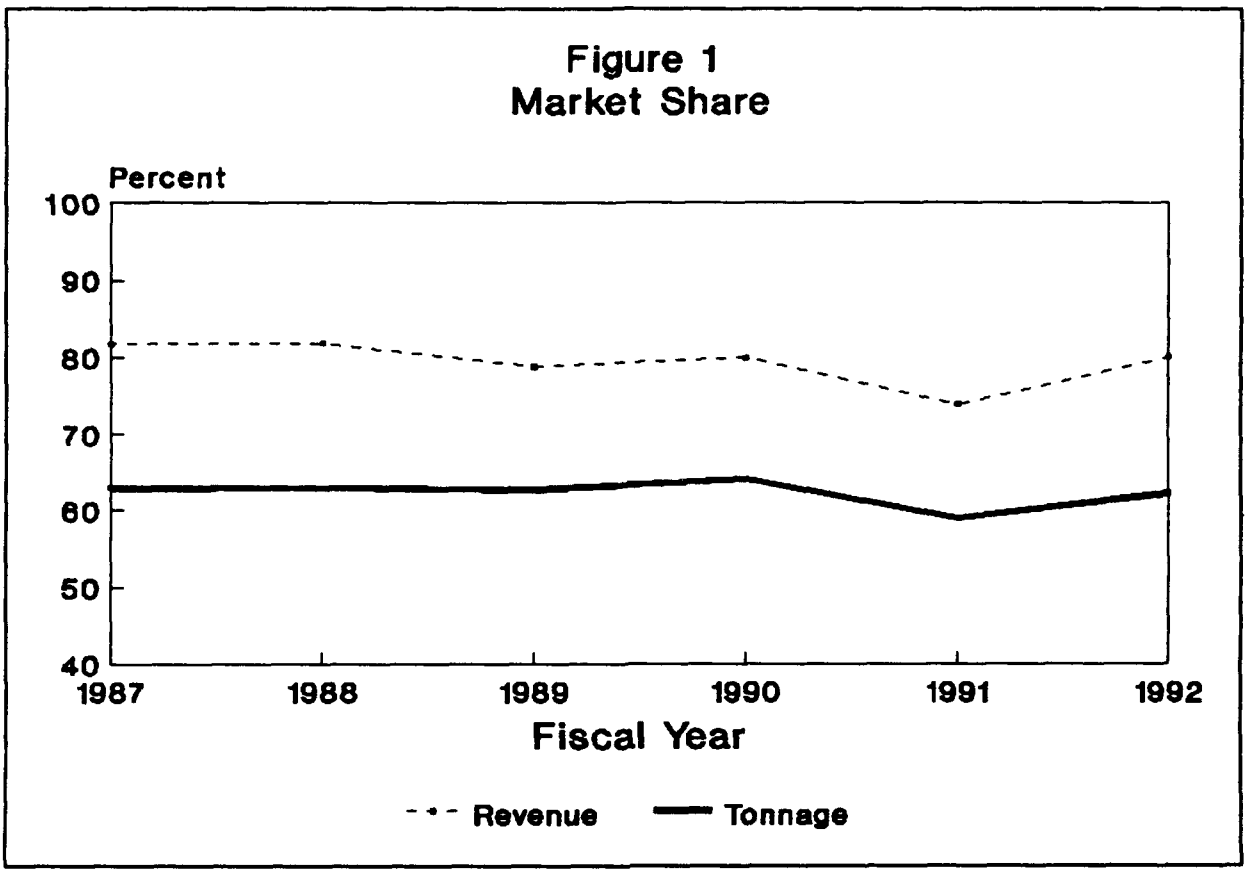
Table 4
Average Revenue Per Mile
Ammunition and Explosive Shipments by Motor Carrier

FY87	FY88	FY89	FY90	FY91	FY92
$1.65	$1.53	$1.54	$1.48	$1.85	$1.48

Source: Military Traffic Management Command

Market Share

With the exception of FY 1991, the munition carriers' share of DOD ammunition and explosives revenue and tonnage has remained relatively flat during the past 6 years. As shown in Figure 1, revenues have ranged between 80 and 85 percent and tonnage between 60 to 65 percent of the DOD market. The industry's decline in FY



1991 was due to greater rail shipments during Desert Shield/Desert Storm. In this regard, most CONUS ammunition and explosive shipments enroute to Southwest Asia moved through the Military Ocean Terminal Sunny Point (MOTSU). With MOTSU's optimum mode mix being 80 percent rail versus 20 percent motor, routings emphasized the rail mode during the war.[23]

Profitability

As previously shown in Table 1 (page 4), the top 10 munition carriers receive over 90 percent of DOD munitions revenue. In light of this concentration, analysis of these carriers presents virtually a complete picture of the munitions carrier industry.

Unfortunately, data was not available for three of the top 10 carriers. Nevertheless, the seven for which data were available still present a fairly complete picture, accounting for 80 percent of the industry's shipments and 82 percent of its revenue.[24]

Based on available data, industry profits are low. For 1990, net income totaled $4.9 million on revenues of $466 million (figures include munitions and non-munition operations). These results equate to a return on sales of 1.0 percent. The industry's position deteriorated in 1991 as it earned $3.8 million on revenues of $504 million, for a return on sales of 0.8 percent.

In terms of individual carriers, results are mixed. As shown in Table 4, three of the seven top ten carriers did not generate a profit in 1990 and 1991 and two more generated profits below the motor carrier industry median for carriers of similar size.

Table 4
Individual Carrier Profitability

	1990	1991
Number of Carriers Not Generating A Profit	3	3
Number of Carriers Generating Profits Below Industry Median	2	2
Number of Carriers Generating Profits Above Industry Median	2	2

Source: Comparisons were made on the basis of Dun's Financial Profiles.

Of the four carriers heavily dependent on munition shipments (over 30 percent of operating revenues), three generated profits in 1991 while only two generated profits in 1990.

Downsizing Within The U.S. Military

The U.S. military is undergoing tremendous change. Many of the changes occurring will directly impact munition carriers. This is particularly true of changes in the U.S. Army, which as shown previously, generates up to two-thirds of the industry's traffic volume. In light of the Army's high traffic percentage, an analysis of its major changes - force structure, base closures, training, ammunition procurement, retrograde, and containerization - provides a reasonably complete picture of the future environment in which munition carriers will operate.

Force Structure

Due to reductions in threats and budgets, the Army is re-structuring itself into a smaller force. Army imperatives governing its downsizing are that the future Army be deployable, lethal, versatile, sustainable, and expansible.[25] In creating a force that meets these imperatives, the Army is adjusting its mix of armored, light, and special operations forces; adjusting its mix of active, reserve, and civilian personnel; and continuing its modernization efforts.

As a result of actions taken during former President Bush's Administration, the Army is reducing its active duty strength to approximately 520,000 soldiers, a decline of 250,000 men and women. In addition, the Army is reducing the number of its active divisions from 18 to 12.[26] While President Clinton has not yet announced full details of defense changes he plans during his

administration, much deeper reductions are expected. In this regard, Secretary of Defense Les Aspin has already instructed DOD to identify $10.8 billion in additional savings for FY 1994. The Army's portion of these savings is $2.5 billion, or 4 percent of former President Bush's FY 1994 proposed Army budget. In addition, Secretary Aspin has indicated that the services should expect a target of 1.4 million active duty troops by 1997, a decline of 200,000 from that proposed by former President Bush.[27]

Base Closures

Concurrent with its force reductions, the Army is closing and inactivating numerous bases, depots, and production plants. Most relevant to the munition carriers is the closing of ammunition depot activities at Pueblo, CO (Pueblo); Gallup, NM (Wingate); Bellemont, AZ (Navajo); and Hermiston, OR (Umatilla).[28] In addition, seven Government owned ammunition plants (Longhorn, Indiana, Louisiana, Kansas, Scranton, Hawthorne, and Sunflower) have recently been inactivated or are scheduled to be inactivated by FY 1995. This will reduce the Army's active ammunition plants from 15 to 8.

Training

Due in large part to the direction of former Army Chief of Staff, General Carl Vuono, the Army has placed tremendous emphasis on combat training during the past several years. Currently, the Army's position is that training is its most important peacetime mission.[29]

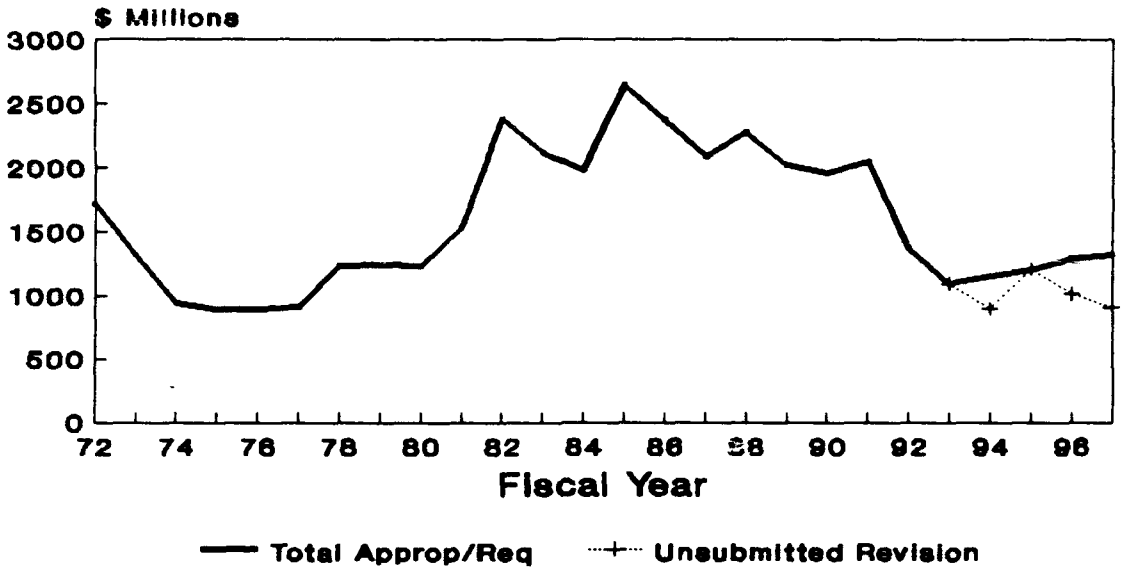
Despite the changing nature of U.S. national security threats, the Army does not envision major revisions to its training strategy.[30] Accordingly, unit training at the Army's combat training centers will continue. Likewise, Army participation in joint and coalition exercises will continue.

While the Army's overall training strategy is not expected to change, training methods will undergo dramatic changes. Revision in doctrine (e.g., AirLand Battle to AirLand Operations, refinement in joint doctrine, and development of combined/coalition doctrine) will change tactical and operational training. Changes recommended in the Army's Long Range Training Plan include increased use of technology, civilian educational facilities, and distributed training techniques.[31] Consistent with this emphasis on technology, simulations and simulators are increasingly being used to reduce training costs and provide greater versatility in training.

Ammunition Procurement

The Army's FY 1992/1993 ammunition procurement budget has decreased significantly from previous 10-year levels. As shown in Figure 2, current levels are approximately 50 percent below levels of the 1980s. FY 1993 levels are low due in part to use of war reserve stocks built up during the Gulf War. These lower procurement levels are projected to continue, however, as budget projections show little real growth through FY 1997 (5 percent per year in current dollars). Moreover, these outyear projections must be viewed as maximum levels in light of President Clinton's actions

Figure 2
Army Ammunition Budget



Approp/Req Source: DCS Ammunition, AMC

and pledges to reduce military spending and former President Bush's own budget revision (not submitted to Congress due to his election loss) which reduced the Army's FY 1994-1997 ammunition procurement budget by nearly 20 percent.

Major categories within the Army ammunition procurement budget are training, war reserves, and support of the production base. As shown in Table 5, procurement for training and war reserves account for approximately 80 percent of the budget. Of importance to the munition carriers is the Army's decision to place priority on the procurement of modern ammunition. Modern ammunition is much more expensive than ammunition for older systems (e.g., one 120MM M1A1 tank training round costs $885 while one training round for the older 105MM M1 tank costs $129). The combination of lower budgets

and higher unit costs will result in lower production volumes.[32]

Table 5
Army Procurement of Ammunition - Budget Plan
($ millions)

	Fiscal Year 1991	1993	1995	1997
Training	$ 614	$ 235	$ 512	$ 590
War Reserves	1,142	367	457	480
Production Base	246	194	207	222
Total Budget	2,047	823	1,209	1,325

Source: Deputy Chief of Staff for Ammunition, Army Materiel Command.

Retrograde

As a result of troop reductions overseas, a significant amount of ammunition is being returned to CONUS. Army retrograde from Europe totaled approximately 140,000 tons in FY 1992 and will total approximately 120,000 tons in FY 1993. Beyond FY 1993, retrograde is estimated at 10,000 - 20,000 tons per year through FY 1997.[33] Army retrograde from the Pacific is currently under review.

Containerization

Use of containers to move ammunition has increased in recent years. By all indications, use of containers will continue to increase, becoming the preferred method of transportation for overseas shipments. Among those pushing the trend toward increased containerization is the United States Transportation Command

(USTRANSCOM). In this regard, USTRANSCOM declared 1992 as the "Year of the Container" and has indicated that one of the key lessons learned from Desert Storm was the need for improved containerization of unit equipment and ammunition.[34] Reiterating this need at the 2nd Annual Joint Munitions Transportation Conference, 9-10 June 1992, USTRANSCOM representatives indicated that munitions containerization is a priority.[35]

Significant benefits are expected through containerization. Specifically, containerization will allow the Army to expedite total system throughput, reduce handling, enhance safety, reduce total system cost, and enhance intransit visibility.

Actions recently completed or planned involving containerization include: CONUS movement of containerized munitions from Umatilla Army Depot Activity to Sierra Army Depot and from Pueblo Army Depot Activity to McAlester Army Ammunition Plant; a test of intermodal transfer operations at Ft. Lewis, WA; use of containers for prepositioned munitions, expansion of the Containerized Ammunition Distribution System (CADS) to the Far East; and as recommended in the Mobility Requirements Study - Volume 1 (unclassified), development of a containerized west coast ammunition loading facility. Ongoing issues in regard to increased use of containers include stuffing of containers, use of commercial containers, and improvements needed in depot/plant capability.[36]

Impacts of Downsizing

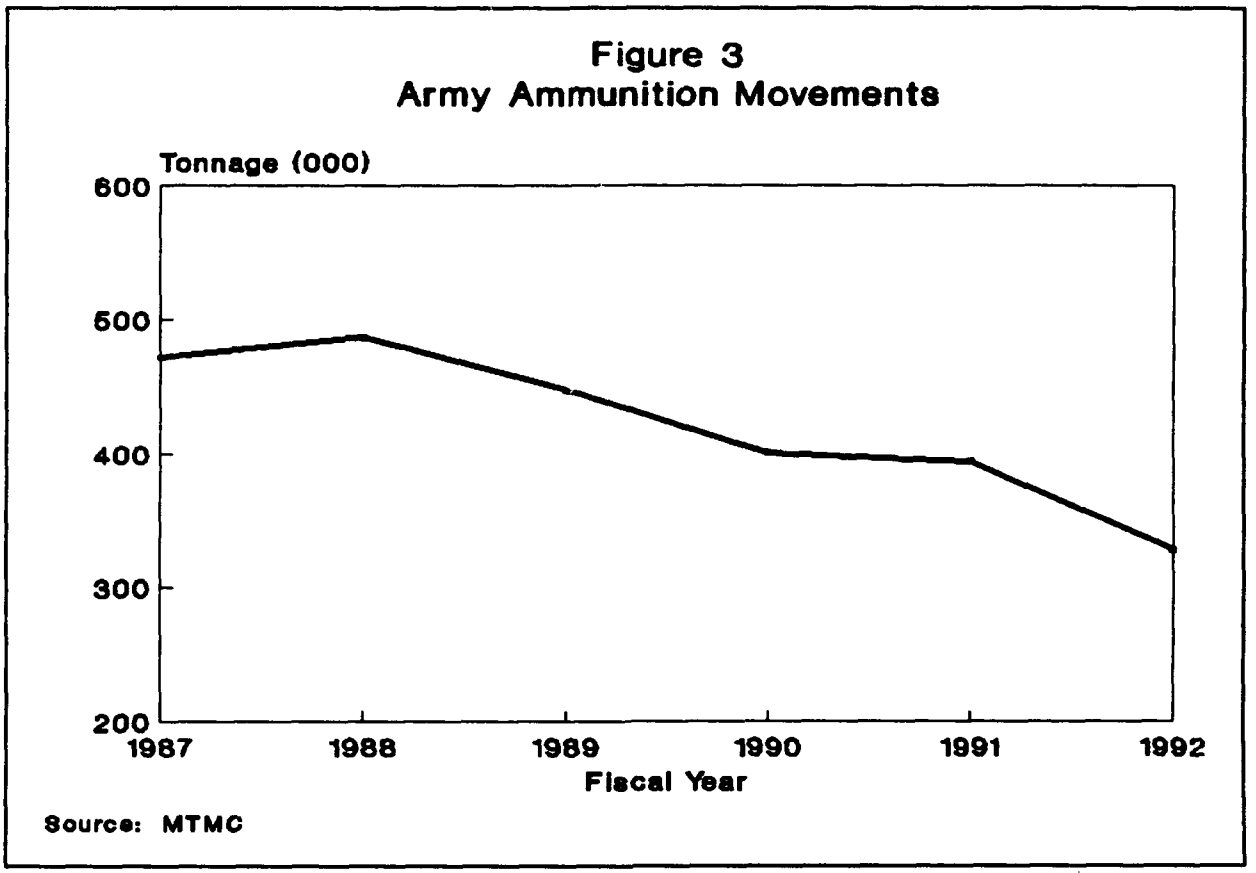
DOD downsizing will not eliminate DOD's heavy dependence on motor carriers. In this regard, downsizing will not eliminate the large number of low volume shipments that due to weight are not conducive to moving via rail. Similarly, downsizing will not ensure that rail service is available at all DOD locations. Finally, downsizing will not eliminate DOD's dependence on the commercial sector during emergencies, making it unlikely that DOD will change its routing policy to permit regular use of organic transportation assets or give preference to a specific mode of transportation (i.e., rail).

There are a number of impacts, however, that will be felt by the munitions carrier industry. These include: lower traffic volumes, changes in traffic patterns, and changes in carrier equipment requirements. These impacts will ultimately lead to fewer munition driver teams and fewer munition carriers.

Lower Traffic Volumes

As shown in Figure 3, the Army is experiencing a downward trend in its annual volume of ammunition traffic. In light of its downsizing efforts, intuitively, this trend will continue. Projecting the level of decline is difficult. Nonetheless, it is important to attempt an estimate as the greater the decline, the greater the impact on the munitions carrier industry.

Two methodologies were used to project future ammunition traffic volumes. First, a linear regression analysis was performed



to determine the relationship between Army FY 1987-1992 ammunition procurement budgets, excluding production base support, and Army ammunition tonnage shipped. This analysis produced the following equation (tonnage and budgets in 000s):

$$\text{Tonnage} = .000195796 \times \text{budget} + 98.6$$

$$R \text{ squared} = .68$$

Based on this equation, Army annual tonnage for FY 1994-1997 will total 284,000 tons in FY 1994 and grow to 315,000 tons in FY 1997.

Due to the weak correlation in the regression equation, however, high confidence can not be put in these projections. Accordingly, a second, more qualitative approach was used.

Using FY 1992 Army tonnage of 328,000 tons as a baseline, there are several events on the horizon that could increase this level as well as decrease it. Major events that would increase FY 1992 levels are retrograde from the Pacific and relocation of ammunition stocks from depots scheduled to close. As mentioned previously, retrograde from the Pacific is under study. In light of the uncertainty of events in the Far East, particularly in North Korea, it is this author's opinion that retrograde will proceed at a very slow pace. Accordingly, the prospect of higher traffic volumes from retrograde is low.

In terms of relocating ammunition stocks, relocation has been completed from Wingate and is expected to be completed from Umatilla by October 1993. Of the remaining stocks at Pueblo (30,000 tons), organic assets will be used to relocate them. At Navajo, there are plans to transfer remaining tonnage (10,000 tons) to the National Guard.[37] In light of these actions, the prospect of higher traffic volumes from relocation of ammunition stocks is also low.

In contrast, there are several events that will reduce future traffic volumes below current levels. These include less retrograde from Europe, lower procurement budgets, purchase of higher cost munitions, and less stock relocation from depot activities scheduled to close. The largest decline will result from decreases in European retrograde from 140,000 tons to 10,000 - 20,000 tons per year. While it appears this would reduce traffic levels by over 100,000 tons, the decline may be much less as MTMC FY 1992

statistics show only 50,000 tons moving via commercial carriers in high volume lanes from east coast ammunition seaports.

A second event that will reduce traffic volumes is completion of relocating ammunition stocks from depot activities scheduled to close. Completion of stock relocation will reduce traffic volumes by at least 15,000 tons, the amount MTMC statistics show moving in high volume traffic lanes during FY 1992.

Based on the above reductions, future Army ammunition traffic is likely to decline to between 250,000 and 275,000 tons per year. Inclusion of additional budget reductions and higher unit cost factors will decrease Army tonnage further, most likely into the range of 225,000 to 250,000 tons per year. Converting these levels to DOD levels, estimated DOD tonnage will range from 400,000 to 450,000 tons per year, 23 to 31 percent below FY 1992 levels.

New Traffic Patterns

Closure of bases, depots, and plants will change numerous traffic patterns. For example, once closure is completed, ammunition will no longer move to or from storage depots at Pueblo, Navajo, Wingate or Umatilla, but will move to or from remaining depots. Similarly, ammunition will no longer move from ammunition plants being inactivated but will move from remaining plants.

During FY 1992, a significant volume of traffic moved in traffic lanes involving a depot or plant scheduled to close (66,000 tons in 29 major traffic lanes). Elimination of these lanes will intensify motor competition in remaining lanes, and to the extent

volumes increase in remaining lanes, rail competition will intensify also. In addition, with all of the scheduled depot closings and two-thirds of the scheduled plant closings located west of the Mississippi River, ammunition backhaul opportunities for drivers delivering in the western part of the U.S will decline, potentially increasing empty miles and carrier operating costs.

Equipment Requirements

An impact not fully quantifiable as yet, but potentially costly to munition carriers, is the impact of increased containerization on equipment requirements. Currently, nearly all munition carriers operate predominately van equipment fleets. Unfortunately, van equipment is not usable for container (MILVAN) movements. Accordingly, to participate in the container market, carriers will need to obtain container chassis or flatbed (twist lock) equipment. The key unknown in determining how much new equipment will be needed is the military's decision on container stuffing locations. If stuffing is performed at origin or a consolidation point, munition carriers will need to acquire new equipment to participate in containerized movements. On the other hand, if stuffing is performed at ocean terminals, no new equipment will be needed. It would be surprising, however, if stuffing at ocean terminal is selected as it requires double handling of material and eliminates any option of preloading and storing material in containers.

Fewer Carriers

Faced with a market of lower traffic volumes and fewer traffic lanes, the munitions carrier industry will soon face a problem of excess capacity. In an already competitive market, excess capacity will only intensify competition. More intense competition in turn will put downward pressure on rates which will put downward pressure on already low profits. With no near-term prospects for a turnaround in traffic volumes, the munitions carrier industry will ultimately shrink in size. With labor costs making up more than 50 percent of carrier costs, shrinkage will come first in the form of fewer driver teams. Ultimately, the costs, uncertainties, and burdens of operating in the munitions market will result in reductions in the number of munition carriers (both top 10 and nontop 10).

Implications For DOD

A smaller, less capable munitions carrier industry raises a number of logistical questions for DOD. The most important of these is whether a smaller munitions carrier industry will be able to meet DOD transportation requirements.

To determine whether a smaller munitions carrier industry will meet DOD transportation requirements, both peacetime and emergency scenarios must be examined. During peacetime, the industry will have little difficulty meeting DOD requirements. In the near term, the industry will have excess capacity, ensuring ample equipment availability for DOD shipments. In addition, excess capacity will keep downward pressure on rates, thus helping DOD adjust to its budget reductions. In the long run, downward pressures on rates and profitability will cause the industry to reduce its size in line with expected traffic levels. While reductions may cause temporary periods of instability, there is no indication that the industry will reduce below that needed by DOD.

Whether a smaller munitions carrier industry will be able to meet DOD requirements in an emergency is not clear. Influencing the outcome, of course, is the magnitude of the emergency. A capacity equal to peacetime levels will hinder the industry's ability to meet immediate surges and will result in spot equipment shortages while equipment is repositioned to where it is needed. In essence, the same problems that were experienced during Desert Shield/Desert Storm (e.g., spot shortages, shortages of equipment,

and shortages of driver teams) will be experienced again, only to a greater extent since the industry will have less capacity than what it had during the Gulf War.

In light of potential shortfalls, should DOD take actions that would provide greater peacetime capacity to ensure a surge capability for emergencies? Before looking at options, it must be noted that the motor carrier industry has tremendous capacity which given time, could be tapped in an emergency. Similarly, through increased containerization and exercising of organic assets, DOD is positioning itself to make greater use of rail transportation and its own capabilities. While these latter two measures will help meet emergency requirements, they will not always offset munition carrier shortfalls. As mentioned previously, use of rail service is not feasible nor practical for all movements. Similarly, if transport capabilities and infrastructure are lacking in countries DOD deploys to, organic assets may be sent to the theater of operations to provide transport capability.

The munition carriers have proposed to MTMC a number of actions they believe will promote their economic health and ensure their ability to meet DOD requirements. These include: (1) establishing a CRAF-type program for munition carriers, (2) providing munition carriers a right of first refusal on DOD freight-all-kinds shipments for backhaul purposes, and (3) restricting movement of Class C ammunition and explosives (see Table 3) to munition carriers only.[38]

While these proposals would assist munition carriers, there is

no strong justification for implementing them at this time. Based on DOD and the airline industry's experience with CRAF during the Gulf War, DOD is currently reviewing the CRAF program and will make changes to it in the future. In terms of a right of first refusal, the coordination and planning needed to ensure the smooth flow of DOD general freight raises doubts as to DOD's ability to implement this option. Finally, DOD's future expansion of satellite monitoring requirements to uncategorized munitions may shift Class C ammunition traffic that is currently transported by general commodity carriers to munition carriers.

While not endorsed by the munitions carrier industry, MTMC has proposed using its Guaranteed Traffic Program as a way to assist the industry. While Guaranteed Traffic has benefitted DOD in terms of improved service and lower rates, it has also benefitted carriers by allowing them to better plan equipment needs and future revenues. As a variation to Guaranteed Traffic, MTMC has developed a negotiation strategy that would award traffic to multiple carriers rather than to just one carrier (see Appendix F). This variation maintains the current benefits of Guaranteed Traffic, but also helps preserve a multicarrier base and lessens the pressure for carriers to engage in "price wars", a practice seen in the award of large traffic volumes and in the movement of single shipments during periods of excess capacity.

Conclusions and Recommendations

As a result of ongoing and future downsizing actions, DOD munitions traffic volumes will decline. The ultimate result of less traffic will be fewer munition driver teams and fewer munition carriers. While a smaller munitions carrier industry will be able to meet DOD peacetime transportation requirements, temporary shortfalls are likely during a major crisis.

It is in DOD's interest that reductions in the munitions carrier industry be made orderly and that the future munitions carrier industry be competitive and responsive. To achieve these objectives and to lessen the impact of carrier temporary shortfalls, it is recommended that DOD:

1. Maintain an organic capability that can quickly augment commercial munition carrier capacity during times of emergencies.

2. Continue to emphasize containerized movement of munitions.

3. Negotiate on a test basis, the multicarrier award of ammunition and explosives traffic under MTMC's Guaranteed Traffic variation.

4. Develop alternatives to carrier disqualification for use in MTMC Freight Boards.

5. Award munition traffic to rail and motor carriers on the basis of service performance and cost (i.e., best value).

6. Following expansion of satellite monitoring requirements to uncategorized munitions, reexamine whether Class C ammunition and explosives should be restricted to movement by DOD munition carriers.

Notes

1. National Military Strategy of the United States. January 1992. p. 10.

2. Military Traffic Management Command. Traffic Management Operations Support Office.

3. DOD traffic management policy (AR 55-355, Chapter 33-15.a.) does not restrict general commodity carriers from transporting Class C ammunition and explosives. However, very few general commodity carriers participate in this market and hence, are not included in this study.

4. American Trucking Associations. December 9, 1992 Memorandum, Trucking Industry Statistics. Number of motor carriers = 265,000. Gross freight revenue = $272 billion. Employment = 7.8 million.

5. Interview with G. H. (Jerry) Turner, Colonel, USA(Ret). Managing Director, Munitions Carriers Conference. 18 December 1992.

6. Three Coast Carriers, Inc., one of the industry's top 10 in FY 1992 is no longer an approved DOD munitions carrier.

7. U.S. Congress, Office of Technology Assessment. Redesigning Defense: Planning The Transition To The Future U.S. Defense Industrial Base. p. 48.

8. American Trucking Associations, Inc. National Motor Freight Classification, NMF 100-R. May 27, 1991. Also, Supplement 8 to NMF 100-R. April 11, 1992.

9. Department of Defense (DOD) Standard Tender of Freight Services, MT Form 364-R (Revised August 1988), Instructions For Use. Effective May 1, 1991.

10. Military Traffic Management Command, Traffic Management Operations Support Office.

11. Army Regulation 55-355, Chapter 34.2.o. Defense Traffic Management Regulation. 31 July 1986.

12. 49 U.S.C. 10921 and 10922.

13. 49 CFR 1043.2.

14. 49 CFR 172 and 177.

15. Interview with G. H. (Jerry) Turner. *op. cit.*

16. Military Traffic Management Command. Freight Information System.

17. Department of Defense Directive Number 4500.9, Transportation and Traffic Management. January 26, 1989.

18. Dorcey, SSG Mike. "Golden Cargo 92". Ordnance. November 1992. p. 15.

19. Installation transportation officers have delegated authority from MTMC to route shipments other than Class A and B ammunition and explosives weighing less than 10,000 pounds.

20. AR 55-355, Chapter 3, General Traffic Management Policies. Defense Traffic Management Regulation.

21. Guaranteed Traffic is the long term award (one year or longer) of specified traffic moving within a specific traffic lane to a single carrier.

22. Interview with Roger F. Maguire, Colonel, USA(Ret). Former Director, Directorate of Inland Traffic, Military Traffic Management Command. Numerous dates.

23. Munitions Transportation Conference, 14-17 May 1991, held at Headquarters, U.S. Army Armament, Munitions and Chemical Command, Rock Island, Illinois.

24. Data sources include 1990 and 1991 annual reports filed with the Interstate Commerce Commission, Dun & Bradstreet's Dun's Financial Profiles, and Transportation Technical Services' TTS Blue Book of Trucking Companies.

25. Strategic Force, Strategic Vision For the 1990s and Beyond. A Statement on the Posture of The United States Army, Fiscal Year 1993 by The Honorable Michael P. W. Stone and General Gordon R. Sullivan. p. 39f.

26. *Ibid.* p. iii.

27. "Find $10.8 Billion to Cut By Monday, Pentagon Told". The Washington Post. February 4, 1993. pp. A1, A22.

28. Telephone conversation with Mr. Larry Gulledge, Chief, Logistics Division, Deputy Chief of Staff for Ammunition, Army Materiel Command. 5 February 1993.

29. FY 1993 Army Posture Statement. *op. cit.* p. 35.

30. Army Training, Changing Threat Not Expected to Significantly Affect Combat Training. United States General Accounting Office Report to the Chairman, Subcommittee on Readiness, Committee on

Armed Services, House of Representatives. December 10, 1991. p. 1.

31. Maintaining a Trained and Ready Force for the 1990s and Beyond. A Statement on the Posture of the United States Army Fiscal Years 1992 and 1993 by The Honorable Michael P. W. Stone and General Carl E. Vuono.

32. FY 1993 Army Posture Statement. *op. cit.* p. 45.

33. Army Materiel Command. Deputy Chief of Staff for Ammunition. 3 February 1993.

34. Deyerie, Major Leta. "1992 is The Year of the Container for USTRANSCOM". Defense Transportation Journal. April 1992. p. 29.

35. Synopsis of Conference Discussions. 2nd Annual Joint Munitions Transportation Conference held at the U.S. Army Armament, Munitions and Chemical Command, 9-10 June 1992.

36. Benefits and actions completed or planned were briefed at the 2nd Annual Joint Munitions Transportation Conference, held 9-10 June 1992 at the U.S. Army Armament, Munitions and Chemical Command, Rock Island, Illinois.

37. Telephone interview with Mr. Larry Gulledge, Chief, Logistics Division, Deputy Chief of Staff for Ammunition, Army Materiel Command. 12 February 1993.

38. Proposals were presented to MTMC, Directorate of Inland Traffic at the Munitions Carriers Conference, December 1991, held at Fort Lauderdale, Florida.

Appendix A

Motor Carriers Approved To Transport Ammunition and Explosives Classes A and B, for the Department of Defense and the Military Traffic Management Command
December 1992

Baggett Transportation Co.
T. F. Boyle Transportation Inc.
Carroll Trucking, Inc.
Central Freight Lines Inc.
Cowan Transportation, Inc.
Davis Transport, Inc.
Deaton, Incorporated
Diablo Transportation, Inc.
Eck Miller Transportation Corp.
Independent Freightways, Inc.
Knox Truck Lines, Inc.
Ligon Nationwide, Inc.
Lynden Transport, Inc.
Magna-Garfield Truck Line
McGil Specialized Carriers, Inc.
Northwest Transport Service, Inc.
Poole Truck Line, Inc.
Prestera Trucking Inc.
R & R Trucking, Inc.
Ranger Transportation, Inc.
Robinson Freight Lines, Inc.
SLT Express, Inc.
Salt Lake Transfer Company
Schneider National Carriers, Inc.
Schneider Specialized Carriers, Inc.
Schneider Transport, Inc.
Tri-State Motor Transit, Inc.
Uintah Freightways
C. I. Whitten Transfer Co.
Yowell International

Appendix B

32 CFR Part 619

Program for Qualifying DOD Freight Motor Carriers

Appendix B to 32 CFR Part 619

Agreement Between the Military Traffic Management Command and Motor Common Carriers Governing the Transportation of Ammunition and Explosives, Class A and B for and on Behalf of the U.S. Department of Defense

This agreement shall be effective from ...te of approval by MTMC until ...ated. Termination is effective upon ...pt of written notice by either party.

c. Nothing in this Agreement will be construed as a guarantee by the Government of any particular volume of traffic.

d. The carrier agrees to immediately notify MTMC of any changes in ownership, in affiliations, executive officers, and/or board members, and carrier name. Carrier understands that failure to notify MTMC shall be grounds for immediate revocation of the carrier's approval and their participation in the movement of DOD freight.

18. Additional Specialized Requirements. The terms of this Agreement will not prevent different or additional requirements with respect to negotiated agreements or added requirements for other types of service and/or commodities.

19. Inquiries. Inquiries may be referred to: Commander, Military Traffic Management Command, ATTN: MTIN–FF, 5611 Columbia Pike, Falls Church, Virginia 22041–5050.

20. Carrier Acknowledgment and Acceptance. The certifying carrier official agrees to ensure that the appropriate company officials and employees are familiar with the requirements, terms and conditions of this Agreement and are in full compliance with the applicable provisions herein. Any information found to be falsely represented in the Motor Carrier Qualification Form, the attachments or during the qualification procedures, to include additional ...ments of this Agreement, shall be ...s for automatic revocation of this ...ment and immediate non-use of the carrier, the affiliated companies, division and entities.

1. _____
(Typed Name and Title of Carrier Official)

verify under penalty of perjury under the laws of the United States of America, that the information contained in the carrier qualification application packet and this Agreement is true, correct and complete. If representing a company or organization, I certify that I am qualified and authorized to offer this information. I know that willful misstatements or omissions of material facts constitute Federal criminal violations punishable under 18 U.S.C. 1001 by up to 5 years imprisonment and fines up to $10,000 for each offense, or punishable as perjury under 18 U.S.C. 1621 by fines up to $2,000 or imprisonment up to 5 years for each offense. Further I understand the requirements of this Agreement and on behalf of _____
(Typed Name of Carrier and MC Number)

agree to comply with the terms and conditions contained herein.

_____
Signature of Carrier Official and Title

_____
Date

Carrier Address _____

_____

_____
Telephone Number (___) _____
24 Hr Emergency Number (___) _____

Interstate Operating authority Certificate Number—MC _____

Intrastate Operating Authority Certificate Number(s) (Include Issuing State—for example PA—12345)

_____

_____

_____

_____

Military Traffic Management Command Acknowledgement/Acceptance

Signature _____
Title _____
Date Approved: _____

9. Appendices B through F are added to read as follows:

Appendix B to part 619—Agreement Between the Military Traffic Management Command and Motor Common Carriers Governing the Transportation of Ammunition and Explosives, Class A and B for and on Behalf of the U.S. Department of Defense

1. The undersigned, who is duly authorized and empowered to act on behalf of _____
(Name of Company, typed or legibly printed)

(herein called the carrier), as a prerequisite for approval to transport ammunition and explosives, class A and B, for the account of the Department of Defense (DOD) and the Military Traffic Management Command (MTMC), (hereinafter called the Government), agree to comply with all additional requirements, terms and conditions as set forth in this Agreement. This Agreement governs the transportation of all DOD class A and B ammunition and explosives shipments administered by the Directorate of Inland Traffic, MTMC. Further, the carrier must also be a party to and in full compliance with requirements contained in the Agreement governing shipments which require a Transportation Protective Service (TPS). Noncompliance by the carrier with any provision of this or any other Agreement it is a party to will be sufficient grounds for immediate revocation of the carrier's approval to participate in the movement of class A and B ammunition and explosives. The carrier may also be subject to further action under the Carrier Performance program, governed by MTMC Regulation 15–1, which could result in nationwide disqualification on all DOD freight shipments.

2. Approval and Revocation.

a. Carrier understands that its initial approval and retention of approval are contingent upon establishing and maintaining, to MTMC's satisfaction sufficient resources to support its proposed scope of operations and services. Sufficient resources include the equipment, personnel, facilities, and finances to handle the traffic anticipated by DOD/MTMC under the carrier's proposed scope of operations in accordance with the service requirements of the shipper.

b. The carrier understands that MTMC may revoke approval at any time upon discovery of grounds for ineligibility or disqualification.

c. In addition to the initial evaluation, the carrier agrees that it will cooperate with MTMC follow-up evaluations at any time subsequent to signing this Agreement to confirm continued eligibility.

d. The carrier certifies that neither the owners, company, corporate officials, nor any affiliation or subsidiary thereof are currently debarred or suspended, or disqualified by a MTMC General Freight Board, or placed in non-use by MTMC from doing business with DOD.

3. Lawful Performance.

a. Carrier agrees to comply with all applicable Federal, State, municipal and other local laws and regulations governing the safe transportation and storage of ammunition and explosives to include title 49 Code of Federal Regulations (CFR) parts 177 and 386 thru 397. Provisions for exempt intra-city operations as defined in 49 CFR will not apply to the transportation of explosives for the DOD. Intrastate carriers are required to comply with all applicable state or federal regulations, whichever are more stringent.

b. No fines, charges, or assessments for overload vehicles or other violations of applicable laws and regulations will be passed to or be paid by any agency of the Federal Government.

4. Operating Authority. Carrier agrees to maintain valid motor common carrier operating certificates for its scope of operations which is not restricted against the handling and transport of hazardous materials or ammunition and explosives, class A and B. Any carrier found to be, in fact, involved in the brokerage, as defined by the Interstate Commerce Commission (ICC), of DOD freight traffic will have its approval revoked.

5. Insurance.

a. Minimum public liability insurance requirements are prescribed in title 49 of the Federal Code of Federal Regulations (CFR) § 387.9 Carrier agrees to ensure that the ICC is provided proof of their public liability insurance, in the form of a BMC 91 or 91–X, or MCS 90, in accordance with sections 29 and 30 of the Motor Carrier Act of 1980. Further, the motor carrier will provide MTMC with a certificate of insurance form. The certificate holder block of the form will indicate that MTMC, 5611 Columbia Pike, Falls Church, Virginia 22041–5050, ATTN: MTIN–FF, will be notified in writing, 30 days in advance of any change or cancellation. The deductible portion will be known on the certificate. The insurance underwriter must have a policyholder's rating in the Best's Insurance Guide, listed in the Fiscal Service Treasury Department Circular 570, Listing of Surety Companies.

b. The carrier agrees to also file with MTMC proof of:

(1) Public liability insurance, Interstate and Intrastate carriers $5,000,000 per vehicle.

(2) Cargo insurance. Cargo insurance in the minimum of $150,000 for loss and damage of government freight per vehicle.

c. The insurance, carried in the name of the carrier, will be in force at all times while this

Agreement is in effect or until such time as the carrier cancels all tenders. The carrier agrees to ensure that the policies include a provision requiring the insurer to notify MTMC prior to any performance of service by the carrier. Changes, renewals, and cancellations notices must also be sent to MTMC, 5611 Columbia Pike, Falls Church, Virginia 22041-5050, ATTN: MTLN-FF. This requirement applies to both interstate and intrastate carriers. Carrier's insurance policy(s) must cover all equipment used to transport DOD freight.

6. Performance Bond.

a. Carrier agrees to provide MTMC with a Performance Bond. The bond secures performance and fulfillment of the carrier obligation to deliver DOD freight to destination. It will cover DOD re-procurement costs as a result of carrier default, abandoned shipments, or bankruptcy. The bond will not be utilized for operational problems such as late pick up or delivery, excessive transit time, refusals, no shows, improper inadequate equipment or claims for lost or damaged cargo. The bond must be issued by a surety company listed in the Fiscal Service Treasury Department Circular No. 570. The bond must be completed on the form provided by MTMC. The bond will be continuous until cancelled. MTMC will be notified in writing, 30 days in advance of any change or cancellation. A letter of intent by the surety company is required with the initial application package. Upon MTMC approval, the carrier agrees to submit the Performance Bond before the Tender of Service will be accepted.

b. The sum of the bond will be determined as follows.

(1) Carriers having done business in their own name with DOD for 3 years or more will be required to submit a Performance Bond in the amount of 2.5% of their total DOD revenue taken from the Freight Information Systems Report (FINS), for the previous 12 months, not to exceed $100,000 and not less than $25,000.

(2) New carriers and those carriers having done business in their own name with the DOD for less than 3 years will be required to submit a Performance Bond based on areas of service they offer. Areas of service will be computed as both origins and destinations.

1 state (including intrastate)—$25,000;
2 to 3 states—$50,000; and
4 or more states—$100,000.

(3) Once a carrier has been doing business with the DOD for 3 years, their bond requirement will change from area of service to percent of revenue.

c. If carrier has secured the Performance Bond as a result of qualifying under the general commodity program or hazardous materials (other than ammunition and explosives, classes A and B) program, no additional Performance Bond is required.

7. Safety and Security.

a. A "satisfactory" safety rating will be maintained with the Federal Highway Administration, Department of Transportation and/or with the appropriate state agency or commission in the case of intrastate. Safety ratings which are "unsatisfactory", "conditional", "insufficient information", or "not rated" will not be accepted. The carrier further agrees to permit unannounced safety and security inspections of its facilities, terminals, equipment and operational procedures by DOD civilian or military personnel, or DOD contract employees. Inspection of carrier equipment, drivers' records, route plans and inspection reports will be permitted during both the pickup and delivery of shipments and in coordination with local police or other authorities while in transit. Carrier also agrees to allow inspection of carrier records and individual driver qualification files. When requested, carrier agrees to provide adequate evidence of an active driver safety, security training and evaluation program. Carrier agrees to furnish, on request, driver's Social Security Numbers to verify their security clearances and allow for inspection of carrier/driver records.

b. Carrier agrees to have in place a company-wide safety and security management program which includes specific on-going safety and security programs for each terminal location. Individual terminal programs will encompass planning and execution of safety and security in routine operations, to include emergency responders and planners, and with the local police and fire authority. Carrier programs will incorporate compliance with all applicable Federal, State, and local statutes or requirements. Conformance with other safety standards, such as NFPA Code 498, will be accomplished as much as possible, with compensating measures for deviations. Safety and security programs at the company wide or terminal level may be subject to evaluation by a DOD representative.

c. The carrier agrees to notify, within a reasonable period of time, the consignor and consignee named by the Government Bill of Lading (GBL) of cargo loss, damage, or unusual delay. Carrier also agrees to notify the consignor and the consignee named on the GBL immediately by telephone of an accident, incident or significant delay. The information to be reported will include origin/destination, GBL number, shipping paper information, time and place of occurrence and other pertinent accident details. Carrier agrees to notify the MTMC area command annotated on the GBL and the Army Operations Center (AOC), within one half (½) hour after notification of the consignor and consignee, and provide status updates as required. The MTMC HOTLINE and AOC telephone numbers are as follows:

—Eastern Area: 800-524-0331; New Jersey only: 800-348-4639
—Western Area: 800-331-1822; California only: 800-624-1361
—AOC: 703-687-0213

When requested, Carrier agrees to furnish MTMC a copy of accident reports submitted to Department of Transportation on Form MCS 50-T (Property) or MCS 50-B (Passengers) when DOD classes A and B explosives movements are involved.

d. Carrier agrees to provide the driver(s) transporting protected commodities an emergency telephone number (indicated on the last page of this Agreement) which, when used at any time (24 hours a day, 7 days a week), will reach a qualified carrier representative who will be able to provide information and assistance. MTMC will be immediately notified if this telephone number should be changed. Carrier also agrees to equip the vehicle transporting the material with communications equipment (CB radio, mobile phone, etc.) capable of being used to obtain assistance in an emergency.

e. Carrier agrees to provide the appropriate Transportation Protective Service (TPS) when requested by a DOD shipper. Carrier further agrees to comply with, and meet, all criteria for TPS as set forth in the Agreement governing the transportation of shipments requiring a TPS and also defined in the MTMC Freight Rules Publication No. 1A (MFTRP No. 1A) and reissues thereto.

f. Carrier agrees to execute a DD Form 441S (Certificate Pertaining to Foreign Interests) as a precondition to providing any TPS for the DOD. Only one DD Form 441S must be executed by a carrier regardless of the number or type of TPS provided.

g. All copies of the Signature and Tally Record (DD Form 1907), Special Instructions for Motor Vehicle Drivers (DD Form 836), and the Motor Vehicle Inspection (DD Form 626), will be transferred from driver to driver throughout the entire movement of classes A and B explosives shipments. All drivers transporting such shipments must sign the DD Form 1907 and follow the instructions shown on the DD Form 836. Furnishing of the Signature and Tally Record is an integral part of a TPS to be provided by the carrier. Carrier must ensure that each person responsible for the proper handling of the shipment signs the Signature and Tally Record at the time he/she assumes responsibility. All drivers transporting such shipment must sign the Signature and Tally Record. When used with Dual Driver (DD), both drivers are required to sign the Signature and Tally Record upon original receipt.

8. Driver Requirements.

a. Carrier agrees to comply with all driver requirements contained in paragraph 7 of the Agreement Between the Military Traffic Management Command and Motor Common Carriers Governing the Transportation of Shipments Which Require a Transportation Protective Service (TPS) for and on Behalf of the U.S. Department of Defense.

b. Carrier agrees that newly employed drivers will not be allowed to transport class A and B explosives until after background checks required by 49 CFR 391.23 have been successfully completed.

c. Carrier agrees that no driver disqualified under 49 CFR 391.15 will be permitted to operate any vehicle transporting class A and B explosives.

d. The driver of a motor vehicle transporting class A and B explosives must undergo a physical examination and must be certified physically qualified to drive a commercial motor vehicle in accordance with 49 CFR 391.43. Carrier agrees to have driver screening programs in place to ensure that the provisions of this paragraph are met.

9. Equipment. Carrier agrees to comply with all equipment requirements contained in paragraph 8 of the Agreement Between the Military Traffic Management Command and Motor Common Carriers Governing the

Transportation of Shipments Which Require a Transportation Protective Service (TPS) for and on Behalf of the U.S. Department of Defense.

3. Shipment.

a. Carrier agrees to ensure that the shipper-provided placards are displayed in accordance with the general requirements found in 49 CFR 172.504.

b. Carrier is responsible for shipments from origin to ultimate destination. The carrier also remains responsible for shipments placed in a safe haven or refuge location. Carrier agrees not to disclose any information to unauthorized persons concerning the nature, kind, quantity, destination, consignee or routing of any protected commodities shipment tendered to it. The carrier further agrees to provide, at no additional cost to the Government, the status of any shipment within 24 hours after an inquiry is made.

c. Carrier agrees to comply with all shipment requirements contained in paragraph 9 of the Agreement Between the Military Traffic Management Command and Motor Common Carriers Governing the Transportation of Shipments Which Require a Transportation Protective Service (TPS) for and on Behalf of the U.S. Department of Defense.

d. When requested by the shipper for reasons of security, carrier agrees to cover the shipment with a carrier-provided tarpaulin. Protective tarping is an accessorial service.

11. Documentation.

a. The carrier agrees to accept GBLs on which freight charges will be paid by the Government, and bound by all terms stated on the SF1103, Government Bill of Lading.

b. The carrier will comply with the documentation prelodge procedures in effect at Military Ocean Terminals when cargo is consigned for further movement overseas. (Prelodging is the submission of advance shipment documents which identifies the shipment to the Military Ocean Terminal prior to delivery of the cargo at the terminal.) Instructions will be provided by the consignor to furnish certain data at least 24 hours in advance of cargo delivery to the terminal.

12. Loss or Damage. The carrier agrees to be liable for loss or damage to cargo in accordance with the provisions of 49 U.S.C. 11707 (the Carmack Amendment to the Interstate Commerce Act). Carrier agrees to promptly settle uncontested claims for loss or damage.

13. Standard Tender of Service.

a. The carrier agrees to comply with the preparation and filing instructions and applicable freight traffic rules publications issued by MTMC. Carrier understands that MTMC will reject tenders not in compliance with these instructions.

b. Carrier agrees to provide a street address where the company office is located in lieu of a post office box number. Carrier agrees to provide the address prior to or in conjunction with submission of any tenders or other rate schedules. The carrier agrees to advise MTMC of any change in address prior to the effective date of the change. Failure to do so is grounds to discontinue use of the carriers.

c. Carrier understands that tenders inadvertently accepted and distributed for use and not in compliance with this Agreement, the provisions contained in the Standard Tender of Freight Services (MT Form 364–R), or the applicable MTMC Freight Traffic Rules Publication, and supplements thereof, will be subject to immediate removal or non-use until corrections are made. The issuing carrier will be advised when tenders are removed under these circumstances.

14. Rates.

a. Carrier agrees to transport Government shipments at the lowest tender rate specifically applicable to the department or agency involved.

b. The carrier's rates must be on file with MTMC, HQ, Eastern Area, ATTN: MTE–IN, Bayonne, New Jersey 07002–5302. The carrier must publish all rates, charges, and accessorial services on a "Department of Defense Standard Tender of Freight Services", MT Form 364–R and must comply with the tender preparation instructions. (Only services annotated with a charge in the tender will be paid by the shipper.)

15. Carrier Performance. Carrier agrees that carrier's equipment, performance, and standards of service will conform with its obligations under Federal, State and local law and regulation as well as with the guidelines found in the Defense Traffic Management Regulation (DTMR) and this Agreement. The carrier fully understands its obligation to remain current in its knowledge of service standards. The carrier accepts the Government's right to revoke approval, declare ineligible, non-use, or disqualify the carrier for unsatisfactory service for any operating deficiency, noncompliance with terms of this Agreement or terms of any negotiated agreements, tariffs, tenders, bills of lading or similar arrangements determining the relationship of the parties, or for the publication or assessment of unreasonable rates, charges, rules, descriptions, classifications, practices, or other unreasonable provisions of tariff/tenders. Rules governing the Carrier Performance Program are found in MTMC Regulation 15–1, and Army Regulation 55–355, DTMR. If a carrier is removed or disqualified for 6 months or more, it will have to be re-qualified.

16. General Provisions. The carrier must possess a valid Standard Carrier Alpha Code (SCAC). When a company holding the appropriate authority has operating divisions each with its own unique SCAC, each such division is required to execute a separate agreement with the MTMC governing the transportation of protected commodities.

17. Terms of the Agreement.

a. The terms of this Agreement will be applicable to each shipment.

b. This Agreement shall be effective from the date of approval by MTMC, until terminated. Termination is effective upon receipt of written notice by either party.

c. Nothing in this Agreement will be construed as a guarantee by the Government of any particular volume of traffic.

d. The carrier agrees to immediately notify MTMC of any changes in ownership, in affiliations, executive officers, and/or board members, and carrier name. Carrier understands that failure to notify MTMC shall be grounds for immediate revocation of the carrier's approval and their participation in the movement of DOD freight.

18. Additional Specialized Requirements. The terms of this Agreement will not prevent different or additional requirements with respect to negotiated agreements or added requirements for other types of service and/or commodities.

19. Inquiries. Inquiries may be referred to: Commander, Military Traffic Management Command, ATTN: MTIN–FF, 5611 Columbia Pike, Falls Church, Virginia 22041–5050.

20. Carrier Acknowledgment and Acceptance. The certifying carrier official agrees to ensure that the appropriate company officials and employees are familiar with the requirements, terms and conditions of this Agreement and are in full compliance with the applicable provisions herein. Any information found to be falsely represented in the Motor Carrier Qualification Form, the attachments or during the qualification procedures, to include additional requirements of this Agreement, shall be grounds for automatic revocation of this Agreement and immediate non-use of the carrier, the affiliated companies, division and entities.

I, _____
(Typed Name and Title of Carrier Official)

verify under penalty of perjury under the laws of the United States of America, that the information contained in the carrier qualification application packet and this Agreement is true, correct and complete. If representing a company or organization, I certify that I am qualified and authorized to offer this information. I know that willful misstatements or omissions of material facts constitute Federal criminal violations punishable under 18 U.S.C. 1001 by up to 5 years imprisonment and fines up to $10,000 for each offense, or punishable as perjury under 18 U.S.C. 1621 by fines up to $2,000 or imprisonment up to 5 years for each offense. Further I understand the requirements of this Agreement and on behalf of

_____
(Typed Name of Carrier and MC Number)

agree to comply with the terms and conditions contained herein.

_____
Signature of Carrier Official and Title

_____
Date

Carrier Address _____

_____

_____

Telephone Number (___) _____

24 Hr Emergency Number (___) _____

Interstate Operating Authority Certificate Number–MC _____

Intrastate Operating Authority Certificate Number(s) (Include Issuing State—for example PA—12345)

_____

_____

Appendix C

Selected pages from Baggett Transportation Company's Driver Training Program

DRIVERS SAFETY & OPERATING MANUAL

BAGGETT TRANSPORTATION COMPANY

2 South 32nd Street
Birmingham, Alabama 35233
Phone Area Code 205 – 322-6501

Outside the State of Alabama
1-800-633-8982

Within the State of Alabama
1-800-292-8935

COMMON CARRIER OF GENERAL COMMODITIES
HAZARDOUS AND SENSITIVE MATERIALS
48 STATES

SINGLE LINE SERVICE
MC 76177

INTRODUCTION

We welcome you as a New Driver who has now met all of the requirements to become associated with Baggett Transportation Company either as a Company employee or a Contractor.

Baggett Transportation Company is one of the oldest Specialized Carriers of Explosives, Blasting Supplies and Commodities declared sensitive by the U. S. Government between points in the United States except Alaska and Hawaii.

We have only one thing to sell and that is service. The success of the Company and its Employees and Contractors depends on your ability to continue to provide a service that is superior to that of our competitors. You, as a Driver, are one of the most important parts of the teamwork required by the total organization in providing such a service. You are our most frequent contact with the customers and the degree of competence and courtesy displayed in their presence will have a direct bearing on their opinion of your Company. Accidents, delays and poor attitude on your part all will hinder this all important customer relations and service and certainly will not be in your best interest.

We have prepared this Manual in order to assist you in carrying out your responsibilities in a satisfactory manner. When you read and understand it, and abide by the rules contained in it, we are sure that we will have a long and pleasant association.

INDEX

DUTIES OF A DRIVER TRANSPORTING HAZARDOUS MATERIALS

1. Each driver must have in his possession a Federal Motor Carrier Safety Regulation Book, commonly called a D.O.T. book. The driver must have read and be thoroughly familiar with Part 397 of the book pertaining to the Transportation of Hazardous Materials; Driving and Parking Rules.
2. Each driver must insure that his tractor fuel tanks are as full as possible before loading to eliminate unnecessary refueling enroute.
3. When you are entering any Military or Commercial Installations the driver must determine if he must turn over to the Security Depatment such items as binoculars and cameras. Firearms are forbidden on any Government Installation. Drivers entering a Government Installation who have a Shotgun for the purpose of handling Armed Guard shipments, **MUST** notify the Installation Guard or Security Personnel that they have a firearm. When entering a Government or Commercial Installation to load or unload Hazardous materials be sure to follow any policy concerning the turning in of any fire producing items such as lighters and matches.
4. You must inspect your equipment before loading. The tractor and trailer must be in good mechanical condition and free of any excessive oil or grease which might constitute a fire hazard. The trailer must be inspected to insure there are no nails, screws or materials that might cause damage to the containers or materials being hauled. Safety Equipment must be in good working order and mounted where it is readily accessible to the driver at all times.
5. No person may smoke or carry a lighted cigarette, cigar, or pipe on or within 25 feet of a motor vehicle which contains explosives, oxidizing materials, or flammable materials; or an empty tank motor vehicle which has been used to transport flammable liquids or gases and which when so used, was required to be marked or placarded with hazardous material markings.

6. While loading the shipment, the driver must take the following precautions:

   A. Do not drop, jar, or bump as this could cause breakage or damage to the freight or container.

   B. Keep from heat.

   C. Protect from moisture.

   D. Avoid friction, such as sliding shipment across floor.

   E. Check loading guide to be sure you are not loading articles together that could create a hazard.

   F. Check packages or containers for damage, leakage, labels, and marking per your shipping bills.

   G. No smoking or open flames are permitted during loading or unloading.

   H. The vehicle's engine must be off, parking brake set, and chock blocks under the wheels.

   I. Make sure the load is properly loaded and secured.

   Equipment transporting Class A or Class B Explosives will be a closed type van except as authorized by the shipping activity.

7. The driver must inspect his load and read the freight bills and/or manifest to insure they are filled out properly. The driver must know the nature of the material he is hauling and what to do in case of fire, accident, leakage, delay enroute or other emergencies. Information pertaining to emergency procedures can be obtained from the freight bills and if a government shipment, from the Special Instructions For Motor Vehicle Drivers (DD Form 836) commonly referred to as Fire Fighting Procedures. If in doubt, obtain the necessary information from a representative of the shipper or your dispatcher before departing the shipper's place of business. In any case, notify Birmingham Dispatch at once should any emergency arise.

SPECIAL INSTRUCTIONS FOR MOTOR VEHICLE DRIVERS	DATE 31 JULY 1980
TO (Carrier's Name and Station Number) BAGGETT TRANSPORTATION COMPANY Tlr #	FROM (Installation Issuing Instructions) EGLIN AFB FLORIDA 32542
ORDER OR LICENSE NUMBER S 1 884 867	THIS VEHICLE IS LOADED WITH (Commodity Description) ROCKET MOTORS - CLASS B EXPLOSIVE
TYPE PLACARDS REQUIRED EXPLOSIVE B	

IN CASE OF FIRE

1. If any part of the vehicle outside of cargo compartment catches fire, take vehicle to a clear or uninhabited area, if practicable, and/or attempt to put fire out immediately with hand extinguishers or other available means. If practicable, ask someone to notify the fire department. Call to the attention of fire or police personnel at the scene of the fire the information on this form.
2. Fires may be fought until the flames reach the cargo at which time firemen and other personnel should be withdrawn to a safe distance, as noted at 5 and 6 below.
3. If in convoy, other trucks proceed to safe distance
4. Water may be used on this cargo ☒ Yes ☐ No (See Other Specific Precautions or Instructions below)
5. Firemen should not approach closer than 2000 feet* from the fire when the fire has reached the cargo. (See Other Specific Precautions or Instructions below)
6. Public should not approach closer than 5000 feet* from fire.
7. As soon as practical, notify the nearest military installation.

IN CASE OF ACCIDENT

1. See brake and block vehicle to prevent movement.
2. Post flags by day and use electric lanterns or reflectors by night, warning traffic approaching from each direction.
3. Call for ambulance, if necessary.
4. Notify nearest police.
5. Notify nearest military installation if cargo is damaged.

ADDITIONAL NOTIFICATION REQUIRED (By phone or wire as soon as possible):

IN CASE OF BREAKDOWN

1. Do not attempt to use loaded vehicle.
2. Post flags by day and use electric lanterns by night, warning traffic from each direction.

GENERAL PRECAUTIONS

1. While operating over public roads, keep at least 300 feet from trucks loaded with explosives or other dangerous articles, a greater minimum distance must be maintained if required by state or municipal regulations.
2. Protect the public from the hazards of the cargo.
3. Do not allow smoking or use of matches or lighters in or near the vehicle.
4. Obey all state and local traffic regulations.
5. Do not exceed posted speed limits.
6. Stop at all railroad crossings.
7. Use designated routes. Whenever possible, avoid congested residential or business areas.
8. Do not permit unauthorized persons to ride on vehicles.
9. At other than carrier rest stops or interchange points, select safe parking space at stopping locations designated by the carrier. Vehicles carrying explosives should not group together at these stopping locations.

OTHER SPECIFIC PRECAUTIONS OR INSTRUCTIONS

PRINCIPALLY A FIRE HAZARD WITH INTENSE HEAT.

PROTECT AGAINST INTENSE HEAT AND OTHER SPECIFIED HAZARDS.

These instructions must be transferred to each subsequent driver for turn-in at final destination. If more than 3 drivers are involved, the additional signatures should be made on an 8½ sheet and attached hereto.	SIGNATURE OF CARRIER'S REPRESENTATIVE [signature]	SIGNATURE OF FIRST DRIVER [signature]
	SIGNATURE OF SECOND DRIVER	SIGNATURE OF THIRD DRIVER

* The distances shown are minimum; greater distances should be used whenever possible.

DD FORM 1 MAY 71 836

Note: The DD 836 should remain with the shipment. If any copies are turned over to you when the load has been delivered, forward them to the Safety Department.

8. The driver must sign for all documents he receives from the shipper and these documents must accompany the shipment from origin to destination. In addition to a Commercial Shippers Bill or Government Bill of Lading the driver may receive the following documents depending on the type of material being transported: Special Instructions for Motor Vehicle Drivers (DD 836) or Fire Fighting Instructions, Motor Vehicle Inspection For Transporting Hazardous Materials (DD Form 626) (DD Form 1907). Copies of the above documents not retained by the receiver must be forwarded to the Birmingham office immediately after delivery.

9. When a driver is transporting Class A or Class B Explosives, he must have in his possession a written plan of the highway routes he is to follow from origin to destination.

10. Be sure the vehicle(s) is properly placarded in accordance with the placard chart, shippers bills and type of Hazardous Material you are transporting. All company trailers will be equipped with permanent type "flip" placards. However, you must have an adequate supply of the following placards with you at all times in case you are dispatched to transport a shipment in leased trailers or containers or when more than one type of placard is required: Explosives A, Explosives B, Dangerous, Flammable, Oxidizers, and Blasting Agent.

11. All loads of Hazardous Material must be sealed and the seal numbers recorded on the Bill of Lading. All shipments transported in closed compartments where the doors are sealed with wire twist or steel cable type seals need not be padlocked.

12. Enroute refueling should be kept to the minimum required to effectively make delivery. When a vehicle which contains Hazardous Material is being fueled, the engine must not be operating and a person must be in control of the fueling process at the point where the fuel tank is filled.

13. Drivers shall operate their equipment at a rate consistent with existing speed laws, traffic, road and weather conditions, as related to their equipment and load.

14. Enroute inspections of equipment are to be made every 2 hours or 100 miles, whichever comes first. This is generally referred to as enroute tire check inspections. This inspection will also include the checking of seals and placards.

15. Unless there is no practicable alternative, the driver must avoid heavily populated areas, places where crowds are assembled, tunnels, narrow streets, or alleys.

16. A vehicle containing hazardous materials cannot be parked on or within 5 feet of the traveled portion of a public street or highway. Vehicles containing Class A or Class B Explosives

cannot be parked on private property (including truck stops) without the knowledge, and consent of the person in charge of the property regarding the nature of the hazardous materials contained in the vehicle. The vehicle cannot be parked within 300 feet of a bridge, tunnel, house, building, or any place where people work or congregate, except when fueling or at loading and unloading sites where it would be impractical to park elsewhere. When you park, find a level solid place, set your emergency brake, place transmission in gear, shut off engine and use chock blocks. Do not use hand valve or emergency switch for parking.

17. All vehicles containing Hazardous material must stop at all railroad crossings, not less than fifteen (15) feet or more than fifty (50) feet from the nearest rail and shall not proceed until it is safe to do so. No changing of gears on any railroad crossing. Use your constant-blinking signal lights to warn other drivers of your action.

18. There shall be no unnecessary delays in the movement of hazardous material. If consignee refuses the shipment or a delay is involved, Birmingham Dispatch is to be notified at once.

19. A vehicle containing hazardous materials must not be operated near an open flame unless its driver has no alternate route and has taken precautions to insure the vehicle can pass the fire without stopping. A vehicle containing Hazardous material must not be parked within 300 feet of an open fire.

20. **Repair and maintenance inside a building.** No person may perform repair or maintenance on a motor vehicle containing hazardous materials inside a building unless.

    (i) The motor vehicle's cargo and fuel containment systems are closed (except as necessary to maintain or repair the vehicle's motor) and do not show any indication of leakage.

    (ii) A means is provided, and a person capable to operate the motor vehicle is available, to immediately remove the motor vehicle if necessary in an emergency.

    (iii) The motor vehicle is removed from the enclosed area upon completion of repair or maintenance work; and

    (iv) For motor vehicles loaded with explosives A or B, flammable liquids or flammable gases, all sources of spark, flame or glowing heat within the area of enclosure (including any heating system drawing air therefrom) are extinguished, made inoperable or rendered explosion-proof by a suitable method. **Exception:** Electrical equipment on the vehicle, necessary to accomplish the maintenance function, may remain operational.

21. Any vehicle containing Class A or Class B Explosives MUST be attended at all times by its driver or if security requirements permit a qualified representative of the motor carrier that operates it except when the vehicle is located on the property of the carrier or on the property of the shipper or consignee of the explosives or in a safe haven if security requirements permit the use of a safe haven. PSS, DDPS, CSS and AG shipments are excluded.

    Note: You may leave explosives unattended in a safe haven only when parked in a designated area if the security requirements permit doing so. PSS, DDPS, CSS and AG shipments are excluded. Before vehicle containing Class A or Class B Explosives can be left at a terminal or on the property of the shipper or consignee, there must be someone on duty to relieve the driver of his responsibilities.

22. A vehicle not containing a PSS, CSS, DDPS or AG shipment is considered attended when the person in charge of the vehicle is on the vehicle, awake and not in the sleeper berth, or is within 100 feet of the vehicle and has the vehicle within his unobstructed field of view. A person attending an explosive vehicle must meet the following requirements:

    A. Be aware of the nature of the hazardous materials contained in the vehicle.
    B. Be instructed on the procedures he must follow in emergencies.
    C. Have knowledge of how to move the vehicle in case of emergency.
    D. Have no other duties other than his responsibility for attending the vehicle.
    E. Know where the bills and emergency instructions are located in case of emergencies.
    F. Have knowledge of where the driver can be located in case of emergencies.

23. Dual driver teams will alternate guard duty time at fuel and meal stops and must log all times spent guarding the shipment on the "On Duty Not Driving" (Line 4) of the Drivers Daily Log.

EMERGENCY EQUIPMENT

1. One full fire extinguisher having an Underwriters Laboratories rating of 10 B.C. or more properly mounted in brackets in a readily accessible location.
2. One spare fuse for each type and size used.

American Trucking Associations, Inc.

HAZARDOUS MATERIALS GUIDE

HAZARDOUS MATERIALS PICK-UP CHECKLIST

Shipping Papers:

- [illegible]
- [illegible]
- [illegible]

Hazardous Waste Manifest:

- [illegible]
- [illegible]

Package Marking:

- [illegible]
- [illegible]
- [illegible]

Labels:

- [illegible]
- [illegible]
- [illegible]

Placards:

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

In Transit:

- [illegible]
- [illegible]

Before Leaving Vehicle:

- [illegible]

MIXED LOADS OF HAZARDOUS MATERIALS

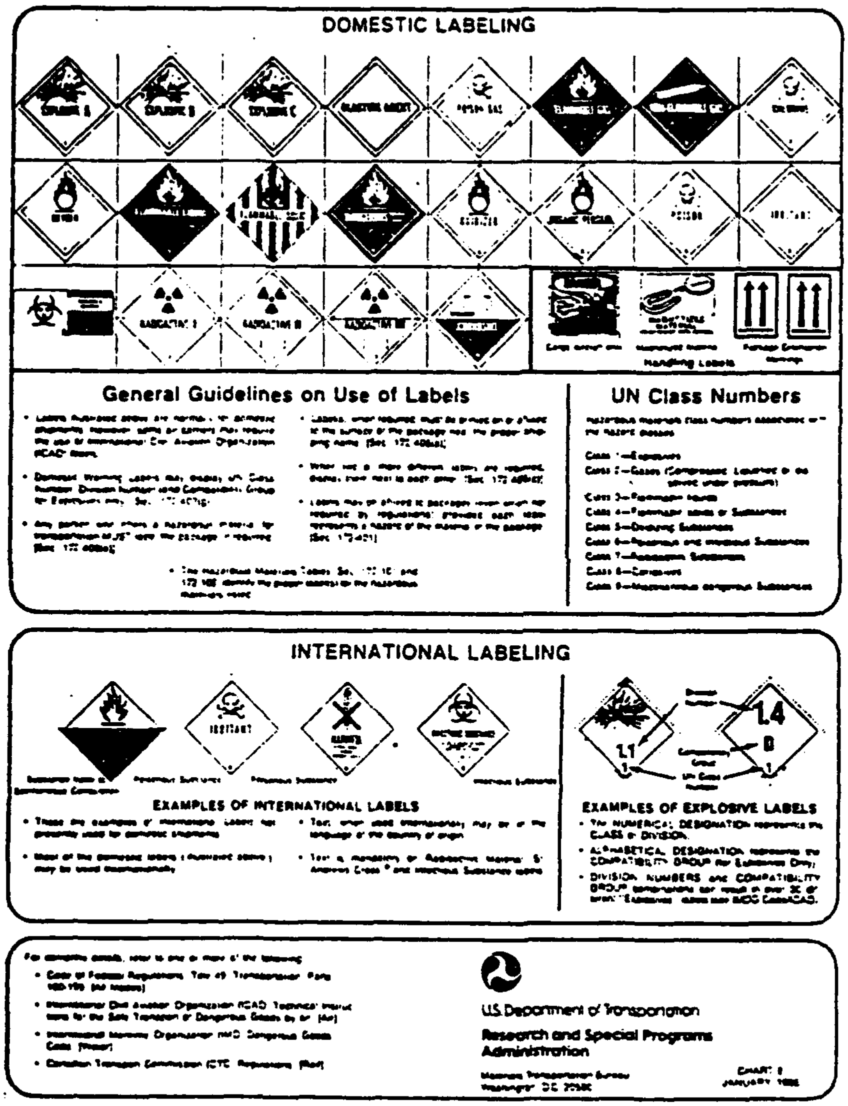
1. Use the DANGEROUS PLACARD when combining 2 or more "1,000 pound" materials (those shaded area). If 5,000 pounds or more of any of these materials are loaded at one location use the class placard as shown to the right along with either a dangerous placard or the class placard(s) for the other materials.

2. The class placard for each "Any Quantity" material (that shaded area) on a mixed load must be displayed regardless of any other placards displayed.

LABEL	WEIGHT	PLACARD	REMARKS
		NO Placard Required	Any hazardous material shipped as a "Limited Quantity" on the Shipping Paper does NOT have to be Placarded
	ANY QUANTITY		Mixed Loads of Explosives A&B Use Explosives A Placard
	ANY QUANTITY		
	ANY QUANTITY		Uranium hexafluoride must be Placarded RADIOACTIVE (any Quantity) and CORROSIVE (1001 lbs. or more).
	ANY QUANTITY		Do NOT Load with Food, Animal Feed or Medicines for Human Use.
&	ANY QUANTITY		Water must not be applied to a fire involving this class material.
	1000 Pounds or More		
	1000 Pounds or More		Flammable placard is an authorized alternative until July 1, 1981.
	1000 Pounds or More		Flammable Placard is an authorized alternative to the Flammable Gas Placard.
	1000 Pounds or More		A Non-Flammable Gas placard is not required when a Flammable Gas placard is displayed.
	1000 Pounds or More		Oxygen Label is Only Authorized for Packages Containing Oxygen as an Alternative to the Oxidizer Label
	1000 Pounds or More		Chlorine placard is required only for packages of more than 110 gallons.
	1000 Pounds or More		
	1000 Pounds or More		
	1000 Pounds or More	DANGEROUS	
	1000 Pounds or More	POISON	Do NOT Load with Food, Animal Feed or Medicines for Human Use.
	1000 Pounds or More		
	1000 Pounds or More		Do NOT Use Oxidizer Placard for Shipments of Oxygen.
	1000 Pounds or More		
Combustible Liquid	More Than 110 Gallons		No Placard Required if Containers are 110 Gallons or Less.

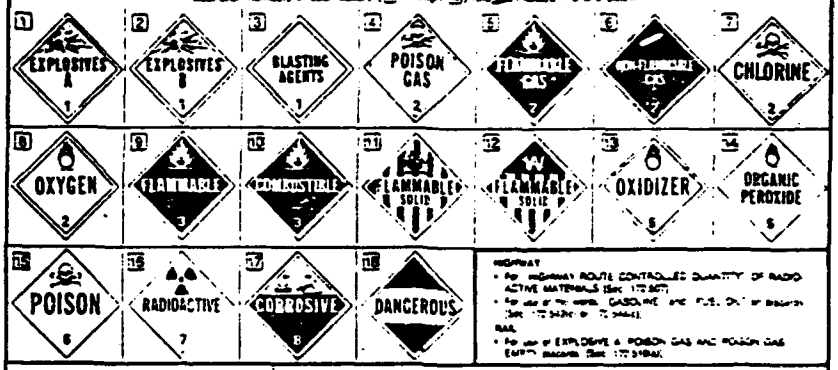
CHEMICAL EMERGENCY-CONTACT CHEMTREC (800) 424-9300

Hazardous Materials Warning Labels



Hazardous Materials Warning Placards

DOMESTIC PLACARDING



HIGHWAY
- For HIGHWAY ROUTE CONTROLLED QUANTITY OF RADIOACTIVE MATERIALS (Sec. 172.507)
- For use of the words GASOLINE and FUEL OIL or diesel (Sec. 172.542(c) or 172.544(c))

RAIL
- For use of EXPLOSIVE A, POISON GAS and POISON GAS EMPTY placards (Sec. 172.519(a))

TABLE 1

HAZARD CLASSES	*NO.
Class A explosives	1
Class B explosives	2
Poison A	4
Flammable gas (DANGEROUS WHEN WET label only)	12
Radioactive material (YELLOW III label)	16
Radioactive material: Uranium hexafluoride fissile containing more than 1.0% U235	16 & 17
Uranium hexafluoride, non-fissile or fissile containing 1.0% or less U235	16 & 17

NOTE: For details on the use of Tables 1 and 2 see Sec. 172.504 (See footnotes at bottom of table 1)

Guidelines

- Placard motor vehicles, freight containers, and rail cars containing any quantity of hazardous materials listed in TABLE 1
- Placard motor vehicles and freight containers containing 1,000 pounds or more gross weight of hazardous materials listed in TABLE 2
- Placard freight containers, RAIL cars or MOTOR VEHICLES containing any quantity of hazardous materials listed in TABLES 1 and/or 2 when offered for transportation by air or water. Under RAIL cars, see Sec. 172.512(b)
- Placard any cars containing any quantity of hazardous materials listed in TABLE 2 except when less than 1,000 pounds gross weight of hazardous materials are transported in Tankers or Containers on Flat Car Service

TABLE 2

HAZARD CLASSES	*NO.
Class C explosives	10
Blasting agents	3
Nonflammable gas	6
Nonflammable gas (Chlorine)	7
Nonflammable gas (Fluorine)	15
Nonflammable gas (Oxygen, refrigerated liquid)	8
Flammable gas	5
Combustible liquid	10
Flammable liquid	9
Flammable solid	11
Oxidizer	13
Organic peroxide	14
Poison B	15
Corrosive material	17
Empty material	18

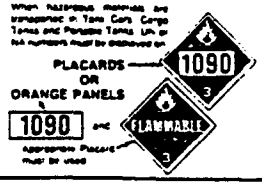
INTERNATIONAL PLACARDING

- Most international placards are identical (IDAC or IMO labels (See International Labeling—Otherwise))
- International placards are enlarged (IDAC or IMO labels (See International Labeling—Otherwise))
- Placard MUST correspond to hazard class or material
- Placard ANY QUANTITY of hazardous materials when loaded in FREIGHT CONTAINERS PORTABLE TANKS, RAIL CARS and HIGHWAY VEHICLES
- International placards may be used in addition to DOT placards for international shipments
- When required, Subsidiary Risk placards must be displayed in the same manner as Primary Risk placards. Class numbers are not shown on Subsidiary Risk placards
- COMPATIBILITY GROUP DESIGNATORS must be displayed on EXPLOSIVES PLACARDS
- UN CLASS NUMBERS and DIVISION NUMBERS MUST be displayed on hazard class placards when required

UN and NA Identification Numbers

- The four digit UN or NA numbers must be displayed on all hazardous materials packages
- UN (United Nations) or NA (North American) numbers are found in the Hazardous Materials Tables Sec. 172.101 and the Optional Hazardous Materials Tables Sec. 172.102 (CFR Title 49 Parts 100-199)
- UN numbers are displayed in the same manner for both Domestic and International shipments
- NA numbers are used only in the USA and Canada

When hazardous materials are transported in Tank Cars, Cargo Tanks and Portable Tanks UN or NA numbers must be displayed on



Appropriate Placards must be used

EUROPEAN NUMBERING SYSTEM

Two number—hazard index identification of Danger 2 or 3 figures) Example: 33 = highly inflammable liquid

33
1088

Bottom number—UN number or substance. Example: 1088 ACETAL

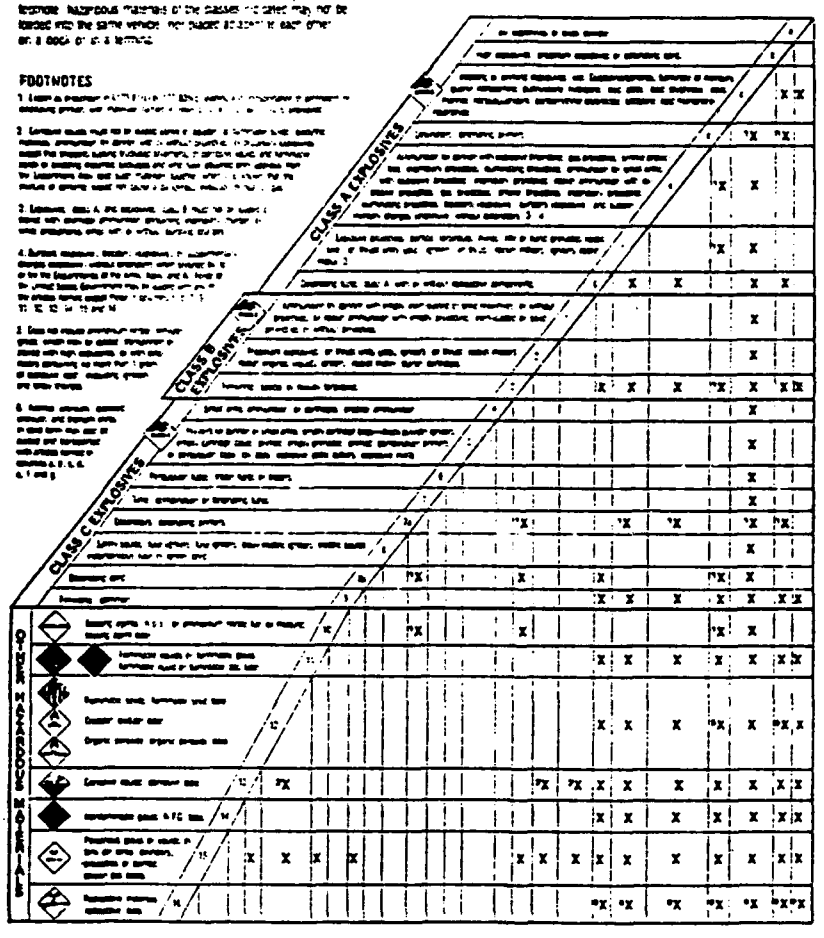
For more complete details on identification numbers see Sec. 172.300 through 172.338

AMERICAN TRUCKING ASSOCIATIONS

HAZARDOUS MATERIALS LOADING & STORAGE GUIDE

INSTRUCTIONS

FOOTNOTES



ATA
Form C1030
7/79

LOADING AND STORAGE GUIDE NO. 2 EXPLOSIVES

Guide No. 1 Deals with Hazardous Materials.

EXPLOSIVES A

DO NOT LOAD OR STORE THIS LABEL

WITH ANY OF THESE LABELS

FOR CLASS A EXCEPTIONS, CHECK LIST BELOW.

Detonating primers, blasting caps with or without safety fuse (including electric blasting caps) in any quantity, do not load or store with Poison Gas or Radioactive labels and SEE NOTES 2, 3, 4, 7 & 10

In quantity of more than 1,000, do not load or store with Flammable Liquid, Flammable Gas, Flammable Solid, Oxidizers, Organic Peroxide, Corrosive, or Non-flammable Gas labels and SEE NOTES 1 & 4

Low explosives or black powder
SEE NOTES 1, 2 & 3

High explosives or propellant explosives, Class A
SEE NOTES 1, 2, 3, 4, 5, 6 & 11

Detonating fuzes, Class A with or without radioactive components.
SEE NOTES 1, 2, 3, 7 & 10

Ammunition for cannon or rocket with explosive projectiles, incendiary projectiles, gas projectiles, smoke projectiles, illuminating projectiles

Ammunition for small arms with incendiary or explosive projectiles

Boosters (explosive) without detonators, Bursters (explosive) without detonators.

Supplementary charges without detonators.

Explosive projectiles;
Bombs; Torpedoes; Mines.

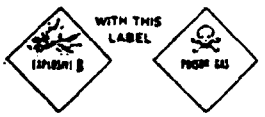
Rifle or hand grenades (explosive)

Jet thrust units (jato), Class A Igniters, Jet Thrust, Class A Rocket Motors, Class A Igniters, rocket motor, Class A
SEE NOTES 1, 2, 3, 6, 8, 9 & 11

Do not load or store these Initiating or Priming Explosives, Wet with any Hazardous Materials listed in Guides 1 or 2 or with gas identification sets.
Diazodinitrophenol.
Fulminate of Mercury.
Guanyl nitrosamino guanylidene hydrazine,
Lead azide
Lead styphnate.
Nitro mannite,
Nitrosoguanidine,
Pentaerythrite tetranitrate,
Tetrazene,
Lead mononitroresorcinate,
SEE NOTE 3

EXPLOSIVES B

DO NOT LOAD OR STORE THIS LABEL



WITH THIS LABEL

SEE NOTES 2 & 12

EXPLOSIVES C

SEE NOTE 2 FOR THE FOLLOWING MATERIALS

Small Arms Ammunition
Primers for cannon or small arms; empty cartridge bags-black powder igniters; empty cartridge cases, primed; empty grenades, primed; combination primers or percussion caps; toy caps; explosive cable cutters; explosive rivets.

Percussion fuzes, tracer fuzes or tracers.
Time, combination or detonating fuzes, Class C
Cordeau detonant fuse, safety squibs, fuse lighters, fuse igniters, delay electric igniters, electric squibs, instantaneous fuse or igniter cord.

NOTES

1: Do not load or store with common fireworks, special fireworks or railway torpedoes
2: Do not load or store with these initiating or Priming Explosives, Wet: Diazodinitrophenol; Fulminate of mercury; Guanyl nitrosamino guanylidene hydrazine; Lead azide; Lead styphnate; Nitro mannite; Nitrosoguanidine, Pentaerythrite tetranitrate, Tetrazene; Lead mononitroresorcinate.
3: May be loaded with Normal and Depleted Uranium, and Thorium metal in solid form.
4: May be loaded with nitro carbo nitrate or ammonium nitrate, fertilizer grade.
5: Do not load with charged electric storage batteries.
6: Do not load or store with Detonating primers or blasting caps with or without fuses (including electric blasting caps)
7: Do not load or store with Ammunition for cannon or rocket (explosive projectiles, incendiary projectiles, smoke projectiles, illuminating projectiles, gas projectiles); Ammunition for small arms with incendiary or explosive projectiles; Boosters, bursters and supplementary charges (explosive) without detonators; Explosive projectiles; Bombs; Torpedoes; Mines; Rifle or hand grenades (explosive); Jet thrust units (jato), class A; igniters, jet thrust, class A-Rocket motors, class A; igniters, rocket motors, class A.
8: Boosters, bursters and supplementary charges (explosive) without detonators may be shipped with detonating fuzes, class A with or without radioactive components when by, for or to the Army, Navy or Air Force.
9: Do not load or store with chemical ammunition containing incendiary charges or white phosphorus either with or without bursting charges.
10: Do not load or store with High Explosives or Propellant Explosives, class A.
11: Do not load or store with Detonating fuzes, class A, with or without radioactive components.
12: Do not load below or adjacent to Corrosive label, do not load Special Fireworks or Railway Torpedoes with Explosive A or Poison Gas labels. Do not load explosive power devices, class B with assembled igniters in the devices unless by, for or to the Army, Navy or Air Force.

AMERICAN TRUCKING ASSOCIATIONS, INC. . 1616 P STREET, N.W. . WASHINGTON, D. C. 20036

WRITTEN PLAN OF ROUTES

The D.O.T. Motor Carrier Regulations requires that a written Plan of Route must be prepared by each vehicle containing Class A or Class B Explosives. This Written Plan of Route must be made on the Hazardous Material Envelope (envelope printed in red) which contains the shipping documents for the load.

A written route plan ensures that the driver's route from origin to destination does not go through or near heavily populated areas, places where crowds are assembled, tunnels, narrow streets, or alleys.

When a driver is dispatched from a terminal the dispatcher must prepare the Written Plan of Route.

When the driver begins his trip at a location other than the carriers' terminal, the driver must prepare the Written Plan of Route. These instructions are printed on the Hazardous Material Envelope.

The Written Plan of Route should show the complete route from origin of the shipment to the destination and must be made before the driver begins his trip.

If you do not understand the D.O.T. Safety Regulations Part 397.9, please contact the Safety Office. We will be glad to discuss and explain the regulation to you.

WRITTEN ROUTE PLAN FOR MOVEMENT OF SENSITIVE WEAPONS, AMMUNITION AND EXPLOSIVES

Drivers will be required to prepare and present their written plan of route at the time they pick up a shipment.

The government inspectors will review the route and if it is determined that the planned route traverses areas of high risk or other threatening situations, they will request that the driver, in cooperation with the carrier's dispatchers, prepare an alternate route which will bypass these areas.

The intent is to maintain transportation security for shipments of sensitive weapons, ammunitions and explosives. In that connection, they have requested that information concerning the nature of the cargo being transported and the route plan only be given to those people with a strict need to know. Drivers are not to divulge to unauthorized persons by CB, telephone, or personal conversation, any information pertaining to the movement of sensitive materials including the route to be traversed, origin, destination, planned stops, commodity being carried or his association with DOD.

PRE-TRIP INSPECTION AND USE OF EQUIPMENT

No motor vehicle shall be driven unless the driver checks to see that the following parts and accessories are in good working

Federal Motor Carrier
Safety Regulations

2 SOUTH 32ND STREET
BIRMINGHAM, ALABAMA 35233

800-633-8982
IN ALABAMA
800-292-8935

as prescribed by:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PARTS 383, 387, 390-399

REMOVEABLE PAGE — PULL SLOWLY FROM TOP RIGHT CORNER

DRIVER'S RECEIPT

This issue of the FMCSR Pocketbook includes all revisions issued on or before September 21, 1992.

I acknowledge receipt of this FEDERAL MOTOR CARRIER SAFETY REGULATIONS POCKETBOOK (ORS-7A). In addition, I agree to familiarize myself with the Federal Motor Carrier Safety Regulations (FMCSR) of the U.S. Department of Transportation, Parts 383, 387, 390-399, Subchapter B, Chapter 3, Title 49 of the Code of Federal Regulations, as contained therein.

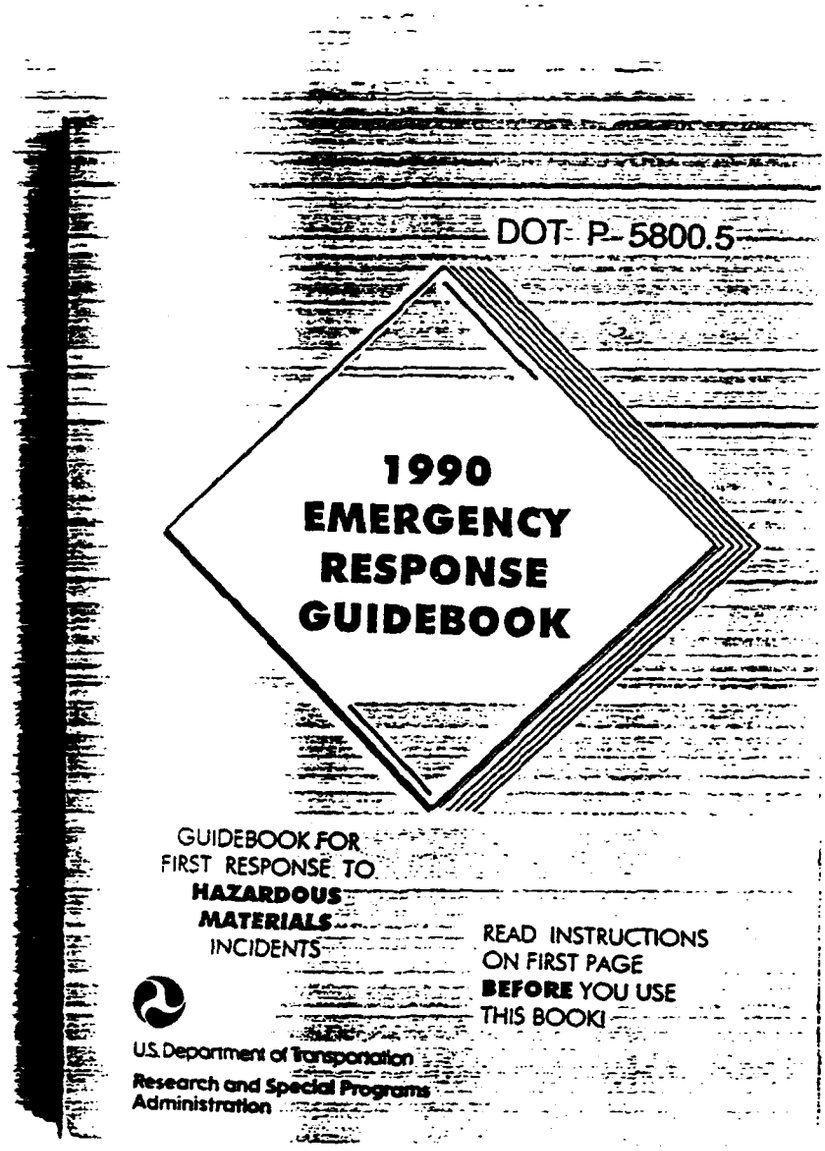
DRIVER'S SIGNATURE _____ DATE _____

COMPANY _____

COMPANY SUPERVISOR'S SIGNATURE _____

11/92

NOTE: This receipt shall be read and signed by the driver. A responsible company supervisor shall countersign the receipt and place it in the driver's qualification file.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1990
EMERGENCY
RESPONSE
GUIDEBOOK
GUIDEBOOK FOR
FIRST RESPONSE TO
HAZARDOUS
MATERIALS
INCIDENTS
READ INSTRUCTIONS
ON FIRST PAGE
BEFORE YOU USE
THIS BOOK!
U.S. Department of Transportation
Research and Special Programs
Administration

Appendix D

Transportation Protective Services

Complete descriptions of transportation protective services are contained in MTMC Freight Traffic Rules Publication No. 1A, issued by Headquarters, Military Traffic Management Command, effective: June 1, 1989.

The following is a summary of major transportation protective services used in the transportation of ammunition and explosives.

Signature and Tally Record Service

A service that requires a signature and tally record from each person responsible for the proper handling of the shipment at specific stages of its transit from origin to destination.

Dual Driver Protective Service

A service that provides the continuous responsibility, attendance, and surveillance of a shipment through the use of two (dual) qualified drivers in the same linehaul vehicle, and includes the maintenance of a signature and tally record. Drivers used to transport security risk category I and II items must possess a valid National Agency Check conducted by the Defense Investigative Service.

DOD Constant Surveillance Service

A service that provides for constant surveillance and custody of shipments in transit. When not being driven the vehicle must be attended at all times by a qualified representative of the carrier.

Satellite Motor Surveillance Service

A service that requires a carrier to use satellite communications to provide the Defense Transportation Tracking System with truck location, intransit truck status changes, and emergency situation notification.

Motor Surveillance Service

A service that requires a carrier to contact a point of contact designated on the Government bill of lading at specified time intervals and provide the vehicle location.

Security Escort Vehicle Service

A service that requires a carrier to provide an escort trail vehicle that maintains discreet, constant surveillance of a freight vehicle.

Appendix E

Military Traffic Management Command September 18, 1992 letter to all munitions carriers, subject: Expansion of DTTS Satellite Motor Surveillance Service

DEPARTMENT OF THE ARMY
HEADQUARTERS
MILITARY TRAFFIC MANAGEMENT COMMAND
5611 COLUMBIA PIKE
FALLS CHURCH, VA 22041-5050

REPLY TO
ATTENTION OF

September 18, 1992

Inland Traffic
Directorate

SUBJECT: Expansion of DTTS Satellite Motor Surveillance Service

ALL MUNITIONS CARRIERS

Dear Sir/Madam:

The military services and the Assistant Secretary of Defense for Command, Control, Communications and Intelligence have approved expansion of the Defense Transportation Tracking System (DTTS). The expansion implements a phased plan that will eventually result in the tracking of all Department of Defense (DOD) Security Risk Categorized (SRC) and Uncategorized (UNCAT) munitions under Satellite Motor Surveillance (SM). In implementing this concept, we have considered the impact on carrier operations and funding, as discussed in meetings and correspondence since April 1990.

Accordingly, beginning on October 1, 1992, the DTTS will enter the second stage in the 3-stage expansion plan. On that date, the tracking of SRC III and IV Arms, Ammunition and Explosives (AA&E) will commence. SRC I and II AA&E shipments, totalling about 6,000 per year, are currently being tracked. Tracking of SRC III and IV will add approximately 15,000 shipments annually to the SM tracking volume. During this phase of the expansion, which will last about 6 months, the DOD will pay up to $0.22 per mile for SM service.

Upon completion of this second stage, the DTTS General Officer Steering Committee will evaluate the progress made to date and will determine the implementation date for the third stage of the expansion. This third stage will entail the tracking of approximately 17,000 uncategorized munitions shipments.

If SM is unavailable, the shipper will request fall-back services. The fall-back transportation protective services (TPS) of SRC III and IV shipments will be Dual Driver (DD). SRC I and II will both continue to require SM and DN. Upon conclusion of each step, the provision for the fall-back option will be removed, and SM will become mandatory (along with DD) for all of the applicable AA&E shipments. Exceptions to the use of SM will be made only upon an approved waiver by the appropriate DOD authority.

As in the past, all Navy and Marine Corps shipments not moving under SM as part of the expansion process will receive Motor Surveillance Service (MS) or SM in lieu of MS.

Because of the extraordinary budget limitations placed on DOD shippers, the military services have advised the Military Traffic Management Command (MTMC) that the DTTS expansion must result in overall TPS expenditures that will not exceed current levels. The services have asked MTMC to establish a ceiling rate applicable to SM during each phase of the DTTS expansion. In establishing these ceilings, MTMC has taken into consideration the dramatic increase in volume of shipments to be tracked. We believe the resulting levels meet both needs.

The ceiling rate for SM during this second stage of the expansion is $.22 per mile with a minimum charge of $160 per truckload. Submission by approved AA&E carriers of rates at or below this maximum is welcome. Rates above the maximum will not be considered. Effective October 1, 1992, all tenders on file should reflect this rate change. Under current planning, ceiling rates for the third stage of the expansion plan will be $.13.

MTMC's Transportation Safety and Security (TRANSS) teams will continue to test panic button activation and response throughout this expansion. Your cooperation is appreciated in this effort to protect you, the public and the national security by ensuring that the system works properly.

Successful implementation of the three-stage expansion process is heavily dependent on driver/dispatcher training and comprehensive adherence to all of the requirements in the newly revised SM rules tariff provision which will be forwarded at a later date. To date, the DTTS staff in Norfolk, Virginia has made every effort to help resolve incorrect status code transmissions, driver SM enabling problems, unstaffed carrier SM monitoring posts, overdue signals, etc. With the added workload during expansion, a continuation of these problems will hamper the staff's ability to conduct normal operations. The result may be extended expansion times and possible impact on ceiling rates.

Since SM is a TPS, performance problems will continue to be treated as serious matters of concern, subject to action under the MTMC Freight Carrier Performance Program.

Points of contact for DTTS expansion are Mr. Robert Jones, MTSS, (703) 756-1089 or Ms. Eleni Brown, MTIN, (703) 756-1565; for DTTS Central Site Administration, Mr. John Lambert, Naval Supply Systems Command (SUP05), (703) 607-2371; for DTTS operational matters, Mr. Gary Hennig, Naval Sea Systems Command, (703) 602-2958.

We appreciate your cooperation in this matter. Should you have any further questions, please contact Ms. Leesha Saunders, MTIN, at (703) 756-1585.

Sincerely,

H. J. Gerber
Colonel, U.S. Army
Director of Inland Traffic

Appendix F

Proposed variation to MTMC's Guaranteed Traffic Negotiation Strategy

Proposed Strategy for Negotiating Rates and Services for the Movement of Ammunition and Explosives

Military Traffic Management Command
Directorate of Inland Traffic
Negotiations Division
12 January 1987

1. Purpose. The purpose of this paper is two-fold. First, this paper presents a new strategy for soliciting transportation rates for the movement of Department of Defense (DOD) ammunition and explosives. Second, it tests the feasibility of using mathematical programming techniques to evaluate bids submitted in response to the new strategy.

2. Background. In 1980, Congress, through passage of the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980, substantially deregulated the motor carrier and railroad industries. As a result of deregulation, shippers found themselves no longer able to rely on Federal regulation to protect their rate and service interests but forced to rely on their own strengths and abilities. The principal strength a large shipper, such as DOD, has is its traffic leverage. The principal abilities needed to use this leverage effectively are the abilities to negotiate effectively and develop innovative negotiating strategies.

In response to these new demands, DOD's traffic manager, the Military Traffic Management Command (MTMC), developed several new negotiating strategies. To date, the most successful of these is MTMC's Guaranteed Traffic Program. The essence of guaranteed traffic is the award of all traffic moving on a specific traffic lane to the carrier able to meet specified transportation requirements at the lowest cost to the Government. Basic movement data such as commodity, volume, award period, and service requirements are set forth in solicitation form and

distributed to the carrier industries. Based on these solicitations, interested carriers submit their rate offerings in the form of bids. The bids are evaluated and the award is made.

As evidenced by the increase in guaranteed traffic awards (2 awards in FY 1981 versus 121 awards in FY 1986), the Guaranteed Traffic Program has been supported by many DOD shippers. Principal reasons for this support have been: lower transportation costs obtained from the award of substantial traffic volumes on a long term basis, lower administrative costs obtained from dealing with one specific carrier, and better service obtained from committed carriers who know that service failures will result in the loss of significant, long-term traffic volumes. (In regard to lower costs, FY 1986 estimated cost avoidances resulting from guaranteed traffic awards totaled $50 million).

The major exception to DOD shipper support has been among shippers of ammunition and explosives. To date, not one guaranteed traffic award has been made in this traffic category. One of the main reasons munition shippers have had for not using the program is their belief that the current motor carrier base must be maintained for mobilization purposes. In this regard, the 100 percent award of traffic to one carrier in high volume traffic lanes is seen as potentially weakening or even bankrupting carriers not fortunate enough or skillful enough to obtain awards. To a certain extent, this concern is legitimate since some of the 40 motor carriers authorized to move ammunition depend heavily on the movement of ammunition and explosives to

support their operations. A major drop in traffic volumes for these specialized carriers would of course put pressure on their viability. Whether the loss of some of these carriers would threaten mobilization capabilities is a question outside the scope of this paper. Accordingly, for the purpose of this paper, it is assumed that the current carrier base of approximately 40 motor carriers is and will continue to be required.

Within the confines of this requirement, it is believed that DOD can benefit by changing its current practice of routing ammunition shipments without fear of weakening its current carrier base. Currently, DOD routes ammunition on an individual basis or by standing route order. By routing in this way, DOD misses the opportunity to take advantage of volume discounts, maintains the burden transportation officers have of contacting MTMC area commands each time a shipment must move or on a 30-day cycle, and fails to eliminate the uncertain response carriers may have toward individual movements. In light of these potential problems and missed opportunities, a strategy that balances the benefits of guaranteed traffic with the need to maintain today's current ammunition carrier base would be highly beneficial. The next section of this paper presents such a strategy.

3. New Solicitation Strategy. As discussed above, ammunition shippers have been reluctant to use the Guaranteed Traffic Program due to the potential consequences of awarding traffic to one carrier. As a compromise intended to overcome this reluctance, it is proposed that traffic in specific lanes be

awarded to three carriers. Reasons for proposing a three-carrier award include: (a) it promotes a multicarrier base, (b) it allows carriers to tailor their bids more closely with their operating conditions (i.e., carriers operating near capacity would not be effectively shut out from the bidding process but could still bid for perhaps the lowest award), and (c) it maintains competition (i.e., smaller carriers which could not compete for large traffic volumes could still compete for the lower awards). In determining the percentages to use to divide the traffic, it is proposed that different percentages be used to promote competition. In this regard, it is proposed that the top award be sufficiently higher than the other awards to provide carriers maximum incentive to offer volume discounts. Similarly, the lowest award must be sufficiently high to provide carriers the incentive to remain committed to the traffic throughout the award period. While a number of allocation mixes would meet these goals, the one proposed as a reasonable fulfillment is a 60% - 25% - 15% allocation.

4. Constructed Solicitation. To demonstrate the feasibility of this strategy, a solicitation package has been constructed and evaluated. While theoretical, the basis of the package lies in actual characteristics of various DOD movements. Specific details are as follows:

Commodity	Ammunition
Origin/Destination	Casing Ammo Plant to Colt Proving Ground
Volume	9,923 tons
Award Period	1 year
Transit time	1 day
Rates	Rates are to be submitted on a cents per hundredweight (cwt) basis.
Rate Categories	Rates are to be submitted on the basis of receiving 60% of the traffic; 25% of the traffic; and 15% of the traffic. No rates should be submitted for categories not desired.
Award Criteria	Lowest total cost to the Government. No more than one award will be made to an individual carrier.

5. Bids Received. To simulate the bidding process, it was assumed that bids were received from 10 carriers (see Table 1). As shown in the table, the first seven carriers expressed interest in all three traffic categories. The next two carriers expressed interest in only the 15% category and the last carrier expressed interest in only the 60% category. Rates submitted were generated by a series of random number programs (see Appendix A). In general, these programs were written to generate a bid within a specific range while at the same time following a tapering principle (i.e., the higher the traffic volume the lower the rate per hundredweight).

Table 1
Bids
(cents per hundredweight)

	Percent of traffic		
	60	25	15
A & E Transport	64	65	69
Bombardier, Inc.	41	42	44
Firepower, Inc.	32	43	48
Calliber Carriers	64	65	67
Magnum Movers	34	43	46
Gunnery Motor Carriers	34	40	43
Sharpshooters, Inc.	30	38	44
Bullseye Transport	--	--	43
Target Freight Company	--	--	34
Piedmont Rail Company	27	--	--

6. Evaluation Process. Having shown how the strategy can be constructed, it is also necessary to show a feasible evaluation process. While evaluating of the bids received would not seem to be much of a problem, the truth of the matter is that evaluation by hand would be extremely time consuming. Specifically, the constructed solicitation contains 350 different three-carrier combinations. Assuming it takes only a couple of minutes to calculate the cost of each combination, this many combinations would require approximately 12 hours of work. Identification of the combinations and comparison of the costs would of course require additional time. With budgetary pressures existing to

reduce staff and increase productivity, a strategy that takes this long to evaluate just one traffic lane would not be practical.

In light of the impracticality of evaluating the bids by hand, use of various mathematical programming techniques were considered. For reasons set forth below, an assignment model was chosen as the method for evaluation.

Assignment Model. The constructed problem is similar to the classical assignment problem. The classical assignment problem consists of assigning a number of jobs or workers to an equal number of machines or projects with each job or worker being assigned only once. Due to development of special algorithms, the assignment model solves these problems very efficiently. The present problem differs from the classical assignment problem only in that the number of assignments is less than the number of carriers bidding for assignment. This imbalance is easily solved, however, by the addition of "dummy" columns that equalize the number of awards with the number of bidders. Assignment to these "dummy" columns would be interpreted as a 0% award. Because of this easy adaptation to an assignment format, the assignment model presents an efficient and effective method for evaluating bids received.

Linear Programming. Because assignment problems are a special class of linear programming problems, use of a linear programming model was also considered. One is not chosen for this problem, however, because (1) the linear programming algorithm is not as efficient in solving these problems as that

used in assignment models, (2) it is not clear whether linear programming models would guarantee integer solutions where inequality constraints are used to allow for the nonuse of certain bidders, and (3) adding "dummy" decision variables to balance the number of assignments and the number of bidders would greatly (and unduly) enlarge the problem.

Integer Programming. A final technique consider was integer programming. The problem is similar to problems successfully solved using 0-1 integer programming techniques (i.e., pilot scheduling, traveling salesman problem). The principal drawback to using integer programming, however, is the relatively inefficient algorithms thus far developed for large problems. While the constructed solicitation is by no means a large problem, use of integer programming took many times longer to solve than use of assignment model and produced unsatisfactory results. Accordingly, use of integer programming was rejected.

7. Evaluation Results. The specific model selected for use was the assignment model contained in Microcomputer Software for Management Science and Operations Management by Barry Render and Ralph M. Stair, Jr. The solution procedure used in this model is known by several names: The Hungarian method, Flood's technique, or the reduced-matrix method.

Preparation for inputting the problem consisted of first determining the cost associated with each bid. Specifically, each bid for 60% of the traffic was multiplied by 119,076 cwt. (9,923 x 60% x 20). Similarly, each bid for 25% was multiplied by 49,615 cwt. and each bid for 15% was multiplied by 29,769 cwt. The only exception to this process was in regard to Piedmont Rail Company. Due to its perceived inability to meet transit time requirements, its costs were set at such a high level ($100,000) that Piedmont would not become part of the solution. Similarly, costs for carriers not submitting bids were set at $100,000 to prevent them from becoming part of the solution. With these exceptions in mind, costs for the bids submitted are shown in Table 2.

The second and final step in preparing the problem was the determination that seven "dummy" columns representing 0% awards would be needed to equalize the number of bidders with the number of awards. Zero costs were assigned to these "dummy" columns since no positive assignment would be made and no costs would be incurred.

Table 2

Costs
(dollars)

	Percent of Traffic		
	60	25	15
A & E Transport	76,272.64[a]	32,249.75	20,540.61
Bombardier, Inc.	48,823.16	20,838.30	13,098.36
Firepower, Inc.	38,104.32	21,334.45	14,289.12
Calliber Carriers	76,272.64	32,249.75	19,945.23
Magnum Movers	40,485.84	21,334.45	13,693.74
Gunnery Motor Carriers	40,485.84	19,846.00	12,800.67
Sharpshooters, Inc.	35,722.80	18,853.70	13,098.36
Bullseye Transport	100.000.00	100,000.00	12,800.67
Target Freight Company	100,000.00	100,000.00	10,121.46
Piedmont Rail company	100,000.00	100,000.00	100,000.00

[a]Cost = Bid x Quantity
Quantities = 60%: 119,076 cwt
25%: 49,615 cwt
15%: 29,769 cwt

Based on this preparation, the problem was inputted and solved to minimize transportation costs. Results are:

60% Award	Sharpshooters Inc.
25% Award	Gunnery Motor Carriers
15% Award	Target Freight Company
Total Cost	$65,690.26

Additional runs were made to choose alternate carriers. The procedure used to choose alternates was to assign in separate runs extremely high costs ($100,000) for each of the prime carriers. Results are:

a. Alternate carriers assuming Sharpshooter failure.

60% Award	Firepower, Inc
25% Award	Gunnery Motor Carriers
15% Award	Target Freight Company
Total cost	$68,071.78

b. Alternate carriers assuming Gunnery Motor Carriers failure.

60% Award	Sharpshooters, Inc
25% Award	Bombardier, Inc
15% Award	Target Freight Company
Total Cost	$66,682.56

c. Alternate carriers assuming Target Freight Company failure.

60% Award	Sharpshooters, Inc
25% Award	Gunnery Motor Carriers
15% Award	Bullseye Transport
Total Cost	$68,369.47

Time required to perform this evaluation totaled approximately 40 minutes.

8. Conclusions and Recommendations. Based on the foregoing discussion and example, several conclusions are made. First, the proposed strategy can be simply stated and clearly communicated in

solicitation format. Second, by awarding traffic to multiple carriers and by limiting the amount of traffic any one carrier can receive, DOD shippers can ensure its traffic is spread among all carriers authorized to handle ammunition. Third, by allowing carriers the flexibility to bid on different volumes of traffic, carriers will be able to develop bids more directly compatible with their marketing strategies and operating conditions. Fourth, based on the success of the Guaranteed Traffic Program, DOD should benefit in terms of lower rates and improved service under this program as well. Fifth, the proposed strategy requires that a record keeping system be maintained. This requirement should not constitute a fatal objection, however, as traffic distribution records are currently required under the Defense Traffic Management Regulation (AR 55-355, Chapter 17-3). Sixth, use of an assignment model is an efficient and effective way to evaluate bids and award traffic. Finally, due to the minimal time needed to formulate and run the assignment model, employee productivity should increase.

In light of the feasibility of the proposed strategy and the potential benefits that exist, it is recommended that the Negotiations division, Directorate of Inland Traffic, implement this strategy on a test basis as soon as possible.

Appendix A

Procedure for Generating Random Number
Cents per Hundredweight

1. Command

Print INT(bottom of range + ((top of the range - bottom of range + 1 * RND(X))).

2. Ranges

15%	Carriers 1 - 7	40 - 70
	Carriers 8, 9	30 - 70
	Carrier 10	- - -
25%	Carriers 1 - 7	35 - (15% bid becomes top of range)
	Carriers 8 - 10	- - -
60%	Carriers 1 - 7	30 - (25% bid becomes top of range)
	Carriers 8, 9	- - -
	Carrier 10	25 - 60

3. Example

Carrier 1, 15% award:

Print INT(40 + (31 * RND(X)))